INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VII	**DEPARTMENT: SCIENCE 2026 - 2027**	**DATE: 03/09/2026**
TEXTBOOK Q &A	**TOPIC: LIFE PROCESSES IN PLANTS**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

1. Complete the following table.

	Feature	**Photosynthesis**	**Respiration**
1.	Raw materials		
2.	Products		
3.	Word equation		
4.	Importance		

[Ans:

S.No.	**Feature**	**Photosynthesis**	**Respiration**
1.	Raw materials	Carbon dioxide, Water, Sunlight, Chlorophyll	Glucose, Oxygen
2.	Products	Glucose, Oxygen	Carbon dioxide, Water
3.	Word equation	Carbon dioxide + Water → Glucose + Oxygen	Glucose + Oxygen → Carbon dioxide + Water + Energy
4.	Importance	Provides oxygen for living organisms and is the primary source of energy for plants	Releases energy required for the growth, repair and functioning of organisms.

2. Imagine a situation where all the organisms that carry out photosynthesis on Earth have disappeared. What would be the impact of this on living organisms?
[Ans: If all organisms that carry out photosynthesis disappeared, there would be no production of oxygen and food for other living organisms. This would disrupt the food chain, as plants provide food for herbivores and oxygen for respiration. Without plants, life on Earth would not be sustained. Photosynthesis also helps take in carbon dioxide from the air. Without it, the carbon dioxide levels would rise, causing the Earth to become warmer and making the climate unstable.]

3. A potato slice shows the presence of starch with iodine solution. Where does the starch in potatoes come from? Where is the food synthesised in the plant, and how does it reach the potato?

   [Ans: The starch in potatoes comes from the food made in the leaves of the plant. The plant makes food in the form of glucose through a process called photosynthesis, which happens in the leaves when the plant takes in sunlight, carbon dioxide, and water.

   Once the leaves make glucose, it travels through the plant to other parts, like the potato, through special tubes called phloem. The potato acts like a storage place where the glucose is turned into starch and stored for later use, which is why when you test a potato with iodine, you see a blue-black colour, showing the presence of starch.]

4. Does the broad and flat structure of leaves make plants more efficient for photosynthesis? Justify your answer.

   [Ans: Yes, the broad and flat structure of leaves makes plants more efficient for photosynthesis. This is because of the following reasons:

   - **The broad and flat shape of leaves provides a larger surface area, allowing more sunlight to be captured. The more sunlight the leaf can absorb, the more energy it can use to produce food through photosynthesis.**
   - **The flat shape helps the leaf to spread out and have more stomata (small pores) on its surface. These stomata allow the plant to take in carbon dioxide (which is needed for photosynthesis) and release oxygen more efficiently.]**

5. X is broken down using Y to release carbon dioxide, Z, and energy.

   X + Y → Carbon dioxide + Z + Energy

   X, Y, and Z are three different components of the process. What do X, Y, and Z stand for?

   [Ans:

   - **X: Glucose – Glucose is the sugar that is broken down in the process.**
   - **Y: Oxygen – Oxygen is used to help break down glucose in respiration.**
   - **Z: Water – Water is a product of the respiration process.**

   - **Thus, the equation represents the process of respiration in plants:**
   - **Glucose + Oxygen → Carbon dioxide + Water + Energy]**

6. Krishna set up an experiment with two potted plants of the same size and placed one of them in sunlight and the other in a dark room, as shown in Fig.10.10

(a) Sunlight (b) Complete dark

Fig. 10.10: Experimental pots

Answer the following questions —

(i) What idea might she be testing through this experiment?
(ii) What are the visible differences in plants in both conditions?
(iii) According to you, leaves of which plants confirm the iodine test for the presence of starch?

[Ans. (i)Krishna is testing the effect of sunlight on plant growth and starch production in plants.
(ii) The plant in sunlight will show better growth, with green leaves and starch production. This is because sunlight is required for photosynthesis, and the plant will produce starch as a result.
The plant in the dark will show stunted growth, with smaller or yellowed leaves, and no starch production. Without light, the plant can't do photosynthesis, so it won't be able to produce starch.
(iii) The leaves of the plant kept in sunlight will show a positive iodine test, indicating the presence of starch. Iodine will turn blue-black when it reacts with starch. Since sunlight is required for photosynthesis, the plant kept in sunlight will have produced starch, whereas the plant kept in the dark will not have produced starch.]

7. Vani believes that carbon dioxide is essential for photosynthesis. She puts an experimental setup, as shown in Fig. 10.11, to collect evidence to support or reject her idea.

(a) Sunlight with carbon dioxide *(b) Sunlight without carbon dioxide* *(c) Dark with carbon dioxide* *(d) Dark without carbon dioxide*

Fig. 10.11: A potted plant with sufficient water is placed under the prescribed conditions

Answer the following questions —

(i) In which plant(s) in the above set-up(s) will starch be formed?

(ii) In which plant(s) in the above set-up(s) will starch not be formed?

(iii) In which plant(s) in the above set-up(s) will oxygen be generated?

(iv) In which plant(s) in the above set-up(s) will oxygen not be generated?

[Ans: (i) Starch will be formed in the plant under (a) sunlight with carbon dioxide because sunlight and carbon dioxide are both essential for photosynthesis. In this condition, the plant can perform photosynthesis and produce starch.

(ii) Starch will not be formed in the plants under (b) Sunlight without carbon dioxide, (c) Dark with carbon dioxide, and (d) Dark without carbon dioxide.

- **In (b), there's no carbon dioxide, which is required for photosynthesis.**
- **In (c), though there is carbon dioxide, there's no sunlight, which is needed for photosynthesis.**
- **In (d), there's neither sunlight nor carbon dioxide, so photosynthesis cannot happen.**

(iii) Oxygen will be generated in the plants under (a) Sunlight with carbon dioxide because both sunlight and carbon dioxide are essential for photosynthesis, during which oxygen is produced.

(iv) Oxygen will not be generated in the plants under (b) Sunlight without carbon dioxide, (c) Dark with carbon dioxide, and (d) Dark without carbon dioxide.

- **In (b), there's no carbon dioxide, so photosynthesis cannot occur, and oxygen is not produced.**
- **In (c), there's no sunlight, so photosynthesis cannot occur, and oxygen is not produced.**
- **In (d), there's no sunlight or carbon dioxide, so oxygen is not produced.**

8. Ananya took four test tubes and filled three-fourths of each test tube with water. She labelled them A, B, C, and D (Fig. 10.12). In test tube A, she kept a snail; in test tube B, she kept a water plant; in test tube C, she kept both a snail and a plant. In test tube D, she kept only water. Ananya added a carbon dioxide indicator to all the test tubes. She recorded the initial colour of water and observed if there were any colour changes in the test tubes after 2–3 hours. What do you think she wants to find out? How will she know if she is correct?

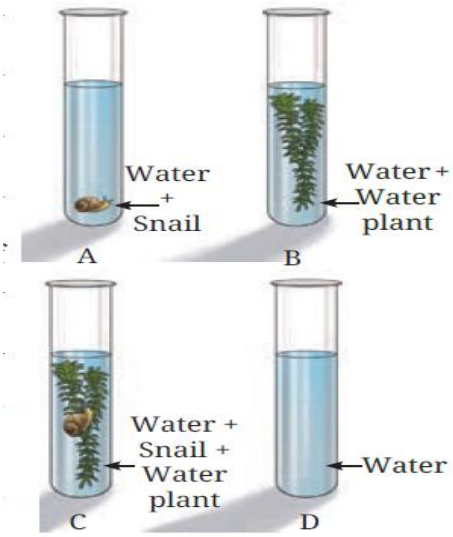

Fig. 10.12: Experimental set-up

[Ans: Ananya is likely conducting an experiment to investigate the role of carbon dioxide in the process of respiration and photosynthesis in aquatic organisms. She is testing whether the presence of a snail (which respires) and/or a water plant (which carries out photosynthesis) affects the level of carbon dioxide in the water over time.

Activity Explanation:

- **Test tube A (with a snail): The snail respires and releases carbon dioxide. If the carbon dioxide indicator turns a different colour, it will indicate an increase in carbon dioxide levels in the water due to respiration.**
- **Test tube B (with a water plant): The water plant carries out photosynthesis, using carbon dioxide and releasing oxygen. If the indicator shows a decrease in carbon dioxide, it will indicate that the plant is taking in carbon dioxide during photosynthesis.**
- **Test tube C (with both a snail and a water plant): In this setup, both respiration (from the snail) and photosynthesis (from the plant) will occur. The snail will produce carbon dioxide, and the plant will consume it for photosynthesis. If there's no change in colour, it could indicate that the plant is using the carbon dioxide produced by the snail for photosynthesis, balancing out the carbon dioxide levels.**
- **Test tube D (only water): This is the control test. Since there's no plant or snail to produce or consume carbon dioxide, any change in the indicator's colour would be due to external factors or the experiment's set-up.**

Ananya will observe the colour change of the carbon dioxide indicator in all the test tubes.

- **Let's say if the carbon dioxide indicator turns a different colour, it indicates a decrease/increase in carbon dioxide (likely due to photosynthesis/respiration).**

9. Design an experiment to observe if water transportation in plants is quicker in warm or cold conditions.

   [Ans: To test whether water transportation in plants is quicker in warm or cold conditions, take two identical potted plants. Place one plant in a warm location (near a heater or sunny spot) and the other plant in a cool place (like in the shade). Add a few drops of food colouring to the water and water both plants. After a few hours, observe the movement of the coloured water up the stem and into the leaves. The plant in the warm conditions will show faster movement of the coloured water, as higher temperatures increase the rate of evaporation and water transportation.]

10. Photosynthesis and respiration are essential to maintain balance in nature. Discuss.

    [Ans: Photosynthesis and respiration help maintain the balance of gases in nature. During photosynthesis, plants use sunlight, water, and carbon dioxide to make food and release oxygen. In respiration, plants and animals use oxygen to break down energy food, releasing carbon dioxide. This exchange of gases keeps oxygen and carbon dioxide levels balanced, supporting life on Earth.]

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