

CHAPTER 10

Life Processes in Plants

VEDA
ACADEMY

CLASS 7TH

NCERT SOLUTIONS - SCIENCE



P1



P2

1. Complete the following table.

S.No.	Feature	Photosynthesis	Respiration
1.	Raw materials		
2.	Products		
3.	Word equation		
4.	Importance		

ANSWER

S. No.	Feature	Photosynthesis	Respiration
1.	Raw materials	Sunlight, water, chlorophyll and carbon dioxide,	Glucose (from food made during. photosynthesis), oxygen (from the air)
2.	Products	Glucose and oxygen (released in the air)	Carbon dioxide, water and energy (used for various activities in the plant)
3.	Word equation	$\begin{array}{c} \text{Carbon dioxide} + \text{Water} \\ \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{Glucose} + \text{Oxygen} \end{array}$	Glucose + Oxygen → dioxide + Water + Energy
4.	Importance	It helps plants make their own food and produces oxygen, which is essential for life on Earth.	It provides energy to plants for growth, development, and other life processes.

2. Imagine a situation where all the organisms that carry out photosynthesis on the earth have disappeared. What would be the impact of this on living organisms?

ANSWER:

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 sustain.



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?

ANSWER:

The starch in potatoes comes from the glucose produced in the leaves during photosynthesis. Photosynthesis occurs in the leaves, where food is synthesised in the form of glucose. This glucose is then transported through the plant to the potato, where it is stored in the form of starch.

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

ANSWER:

Yes, the broad and flat structure of leaves makes plants more efficient for photosynthesis. This shape increases the surface area, allowing more sunlight to be absorbed by the chlorophyll present in the leaves. It also helps in the exchange of gases through the stomata, thus enhancing the process of photosynthesis.

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



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

ANSWER:

X – Glucose

Y – Oxygen

Z – Water

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



(a) Sunlight (b) Complete dark

Fig. 10.10: Experimental pots

Answer the following questions.

- (i) What idea might she be testing through this experiment?

ANSWER:

Through this experiment, she is testing whether sunlight is necessary for photosynthesis in plants or not.

- (ii) What are the visible differences in plants in both the conditions?

ANSWER:

The plant kept in sunlight looks healthy and green as it performs photosynthesis while the plant kept in the dark room looks weak, pale, and yellowish because it cannot perform photosynthesis properly.



(iii) According to you, leaves of which plants confirm the iodine test for the presence of starch?

ANSWER:

The leaves of the plant kept in sunlight will confirm the iodine test for starch.

7. Vani believes that 'carbon dioxide is essential for photosynthesis'. She puts an experimental set-up, as shown in Figure, to collect evidence to support or reject her idea.

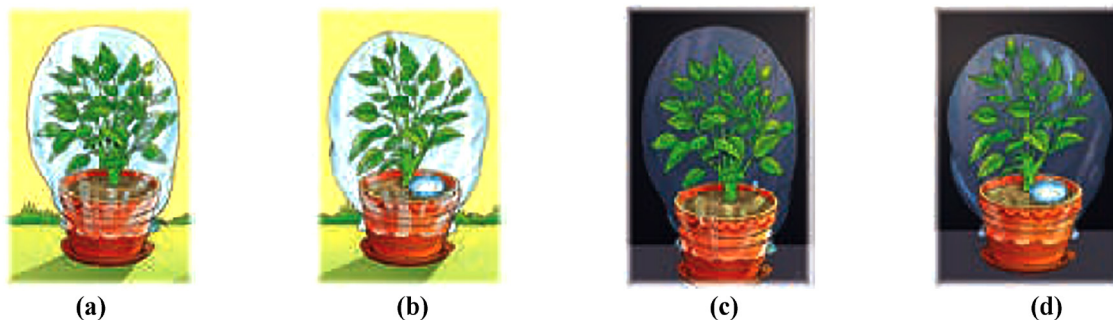


Figure A potted plant with sufficient water is placed under the prescribed conditions.

(a) Sunlight with carbon dioxide

(b) Sunlight without carbon dioxide

(a) Dark with

(b) Dark without carbon dioxide carbon dioxide

Answer the following questions.

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

ANSWER:

Only in plant kept in sunlight with carbon dioxide, starch will be formed.

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

ANSWER:

In all plants except the plant kept in sunlight with carbon dioxide.

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

ANSWER:

Oxygen will be generated in a plant kept in sunlight with carbon dioxide.

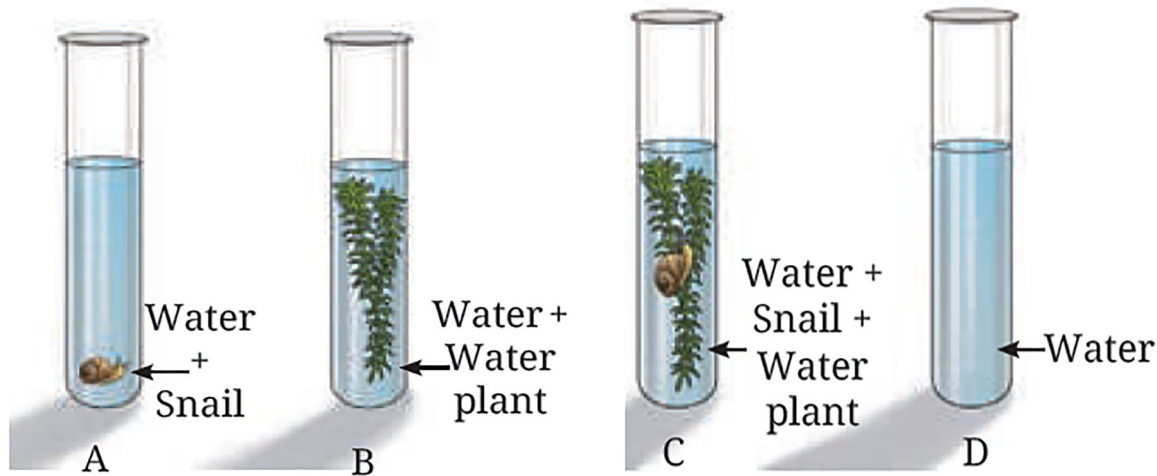
(iv) In which plant(s) in the above set-up(s) will oxygen not be generated?

ANSWER:

Except for the plant kept in sunlight with carbon dioxide, oxygen will not be generated in any of the other plants.



8. Ananya took four test tubes and filled three - fourth of each test tube with water. She labelled them A, B, C, and D (Figure). 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 are 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?



ANSWER:

Ananya wants to find out how plants and animals affect the amount of carbon dioxide in water. She is testing the role of respiration and photosynthesis. The carbon dioxide indicator changes colour depending on how much carbon dioxide is present in the water. Ananya will know she is correct by observing the colour changes in the carbon dioxide indicator in each test tube:

- 1. Test Tube A (Snail only):** The indicator will turn yellow/orange, showing increased carbon dioxide due to the snail's respiration.
 - 2. Test Tube B (Plant only):** The indicator will turn blue/purple, showing decreased carbon dioxide because the plant uses it during photosynthesis.
 - 3. Test Tube C (Snail + Plant):** The colour may stay neutral or slightly blue, showing a balance as the snail gives out carbon dioxide and the plant uses it.
 - 4. Test Tube D (Only water):** No colour change, as there is no living organism to add or remove carbon dioxide.
9. **Design an experiment to observe if water transportation in plants is quicker in warm or cold conditions.**

ANSWER:

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.

ANSWER:

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 food for energy, releasing carbon dioxide. This exchange of gases keeps oxygen and carbon dioxide levels balanced, supporting life on Earth.

