

TENDER HEART HIGH SCHOOL, SEC - 33B, CHD.

Class - VII

Subject - Biology.

Chapter - 4.

Photosynthesis and Respiration.

Teacher : Ms. Nidhi

Good Morning students! This lesson is of Class - VII for the subject of Biology, Chapter - 4, Photosynthesis and Respiration of your textbook titled Concise Biology, Selina Publications. It is being submitted to you on 14.10.2024

Dear students, in your lesson of Photosynthesis and Respiration today we are going to discuss the significance of Photosynthesis and the various activities related to Photosynthesis. Kindly open your book on Page no - 44 and listen carefully.

Before discussing the significance of Photosynthesis let us know about the utilisation of synthesized food in plants.

Food manufactured in the leaf is required for use by all other parts of the plant. Glucose formed during photosynthesis is stored in the leaf as starch.

At night, this starch is reconverted into sugar and is transported in solution through the phloem to different parts of the plant, where it may be stored in stems and fruits or is utilised to produce energy for various functions in the plant.

Now children you have very well understood the significance of photosynthesis. Let us recapitulate it.

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1. **Synthesis of food** - green plants are unique as they are able to synthesize food. Therefore, all animals directly or indirectly depend on plants for food.
2. **Purification of atmosphere** - green plants take in carbon dioxide from the atmosphere during photosynthesis and release oxygen thereby purifying the air.
3. **Maintaining a balance** - Photosynthesis maintains a balance between oxygen and carbon dioxide in the atmosphere. This balance will be disturbed in the absence of photosynthesis.

Let us now understand how chlorophyll is necessary for photosynthesis with the help of an activity.

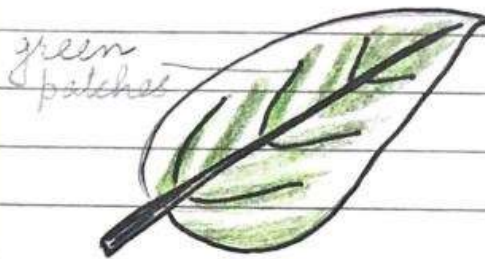
We all know that the green colour of leaf is due to the presence of chlorophyll. Some leaves have white or yellow patches on them. Such leaves are called variegated leaves.

If we carry out a starch test on a variegated leaf of the plant that has been kept in sunlight, only those parts of the leaf will turn blue-black which were green, while the white or yellow patches remain unchanged.

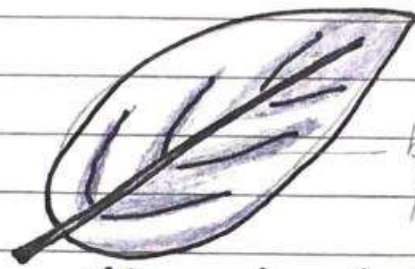
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Variegated leaf



After starch test.

Now let us know how starch test can be performed in the laboratory.

1. Pluck a green leaf from a plant which has been growing in bright sunlight.
2. Put this leaf in a beaker with boiling water for about 2-3 minutes so as to kill the cells, denature the enzymes (which means modifying the molecular structure of a protein) and make the leaf more permeable to iodine solution.

Permeable means allowing liquids or gases to pass through it.

3. Take the leaf out of the beaker and place it inside a test tube containing ethyl alcohol.
4. Place the test tube in a beaker containing water and heat the water. This is called water bath.
- * Remember children never boil alcohol directly as it may catch fire.
5. As the alcohol begins to boil, the chlorophyll dissolves in it and the leaf become colourless.
6. Wash the leaf with water to make it soft.
7. Keep the leaf in a petridish and put a few drops of iodine solution over it.

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What do you observe?

The leaf turns blue-black in colour. This shows that starch is present in the leaf.

★ Now, let us understand that light is necessary for photosynthesis.

1. For that take a potted plant which has been destarched. You can destarch the leaves of a plant by keeping in a dark room for 2 days. As no photosynthesis take place in the dark, the leaves will become starch free.
2. Cover a part of any one leaf on both sides with black paper.
3. Place the plant in bright sunlight for atleast 5-6 hours.
4. Pluck the covered leaf and remove the black paper.
5. Test the leaf for the presence of starch by iodine test.

What do you observe?

You will notice that uncovered part of the leaf turns blue-black whereas covered part turns brownish.

This happens because the uncovered part of the leaf received sunlight and was able to perform photosynthesis and manufactured starch which turns blue-black when tested for iodine. However, the

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covered part was not able to photosynthesize because it was not exposed to sunlight. Hence, it did not turn blue-black when tested with iodine.

This shows that light is necessary for photosynthesis.

Next, let us understand that oxygen is produced during photosynthesis with an activity. For that kindly open page no-46.

1. Fill a trough (about three-fourth) with water.
2. Place a few cuttings of Hydrilla (a water plant) in it and cover them with a funnel.
3. Fill a test tube with water and cover its mouth with your thumb.
4. Place it slowly over the stem of the funnel.
5. Keep the set-up in the sunlight for a few hours.

What do you observe?

You will see bubbles of gas collecting in the test tube.

Remove the test tube when it has been filled with gas. Remember to close its mouth with your thumb.

Next bring a glowing splinter near the mouth of the test tube.

What do you observe?

The splinter starts burning with a bright flame.

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This confirms that gas produced is oxygen as it supports combustion. Hence oxygen is produced during the process of photosynthesis.

I am ending today's topic with this activity. Now children give a thorough reading of all the activities and along with that listen to the audio to understand them well.

Thank you.