

**PHOTOSYNTHESIS PROJECT**

Members of the Group: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ School Year: \_\_\_

1. Watch the following video about photosynthesis:

“The simple story of photosynthesis and food - Amanda Ooten”

(Link: <https://www.youtube.com/watch?v=eo5XndJaz-Y>)

1. Answer the following questions:
2. Where do plants take the raw materials that they need for photosynthesis?

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1. Where does photosynthesis occur? Name the organelle.

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1. State the molecules that can be made out of glucose after photosynthesis and explain their functions in plants and animals.

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1. Why is photosynthesis beneficial to us?

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1. Explain how are plants and animals related in terms of photosynthesis and respiration.

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1. There are some factors that affect the rate of photosynthesis.

Prepare a practical activity to be carried out in the lab to find out which factors affect photosynthesis and which are the optimum conditions for it to occur?

Explain the apparatus that you would use and make a diagram.

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1. A group of scientists working in an experimental plant research station were interested in how different factors play a part in the control of photosynthesis. They made a series of measurements under different conditions. Their results are shown in the table below.

|  |  |
| --- | --- |
| Temperature (ºC) | Rate of photosynthesis (Arbitrary Units) |
| 5 | 20 |
| 10 | 22 |
| 15 | 31 |
| 20 | 45 |
| 25 | 54 |
| 30 | 52 |
| 35 | 48 |
| 40 | 32 |

1. State the temperature at which the plant carried out the highest rate of photosynthesis.

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1. Plot a line graph showing the results of temperature against rate of photosynthesis. Use graph paper. [6]
2. Explain the effect of temperature in photosynthesis *using the information on the results obtained during the investigation and your graph*.

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1. Give a reason why temperature decreased after 30ºC.

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1. Two groups of seedlings were grown in solutions that were deficient in two ions that plants need. Group M was grown without nitrate ions; group N was grown without magnesium ions. Group O received all the ions that plants require. The results are shown in the table.

|  |  |  |
| --- | --- | --- |
| **Group of seedlings** | **Colour of leaves** | **Growth** |
| M | Yellow (especially the lower leaves) | Reduced growth but not as much as seedlings in group N |
| N | Lower leaves: yellow  Upper leaves: pale green | Severely reduced growth |
| O | Green | Normal growth |

1. Explain the effects of the deficiencies of nitrate ions and magnesium ions as shown in the table.

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1. Why was it necessary to include the seedlings in group O?

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1. Many crops throughout the world are grown in glasshouses. Explain how conditions are controlled in glasshouses to achieve high yields.

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