

Item 1

A group of S6 students carried out an experiment to investigate the light independent reaction using a “lollipop”. In the experiment, single celled algae, *Chlorella* were grown in light in a thin transparent lollipop in the presence of carbondioxide labeled with isotope of carbon, ^{14}C . At 10 seconds interval, samples of photosynthesizing *Chlorella* were dropped into hot methanol to stop the reactions instantaneously. They the extracted the compounds formed from the organisms and identified those that are radioactive ad summarized their results in a table below.

Support material

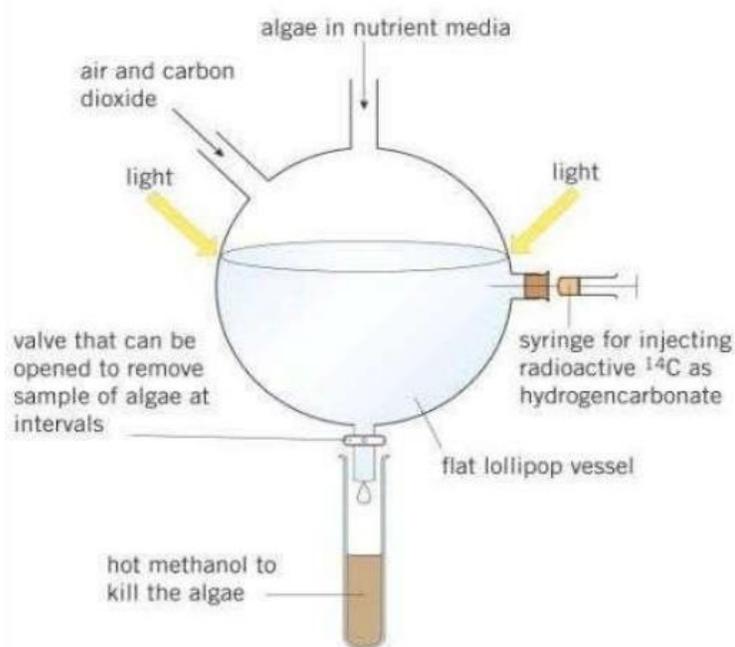


Table of results.

Time (seconds)	Compounds identified as radioactive
0	Carbon dioxide
10	Glycerate-3-phosphate
20	Glycerate-3-phosphate + phosphoglyceraldehyde
30	Glycerate-3-phosphate + phosphoglyceraldehyde + glucose

40	Glycerate-3-phosphate + phosphoglyceraldehyde + glucose + ribulose bisphosphate
50	Glycerate-3-phosphate + phosphoglyceraldehyde + glucose + ribulose bisphosphate + amino acids

Tasks

- a) As a student of S₅, help the S₆ scientists account for the following;
 - i) Explanation of how hot methanol instantaneously stop further reactions from taking place.

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- ii) The occurrence of the radioactive carbon in ribulose bisphosphate and amino acids.

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b) Suggest an explanation why the S6 scientists carried the experiment in the presence of light.

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c) Account for the economic importance of the organisms used in the experiment above.

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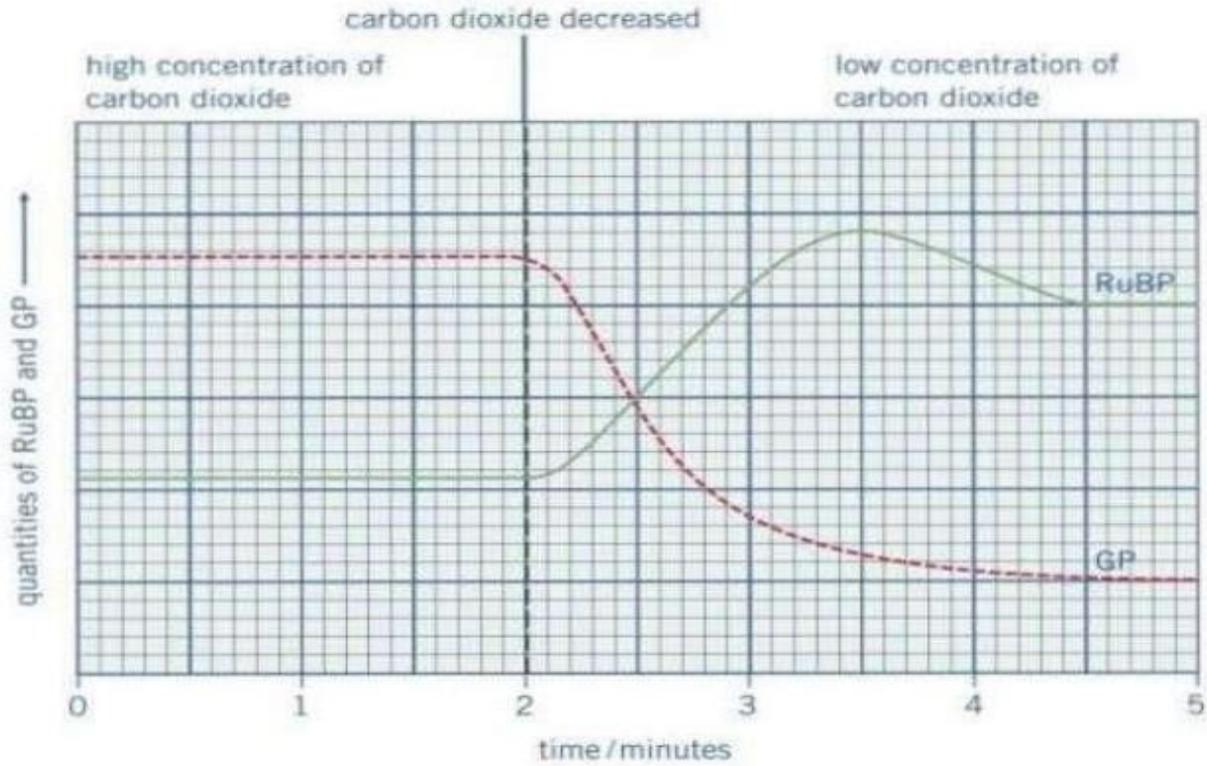
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In a further experiment, they collected the algae at intervals of 1-minute over a period of 5-minutes and measured the quantities of glycerate-3-phosphate (GP) and Ribulose bisphosphate (RuBP) formed. Due to limited supply of hydrogen carbonate, they decreased the supply of carbon dioxide until the 5-minutes elapsed. The results obtained sparked confusion among the S6 scientists. They plotted the results on a graph as shown below.



As a plant specialist, one of the S6 scientists has approached you for help and presented the graph above in which he asked you to;

- a) Account for the quantities of GP and RuBP before and after the scientists became insufficient of hydrogen carbonate.

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Item 2

Pharma is a dietary supplements manufacturer that specializes in manufacture of supplements rich in all food nutrients in different proportions. Some of their products include the following;

Product A; 85% protein, 5% carbohydrates, and minerals.

Product B; A multivitamin and multimineral supplement.

Product C; Rice flour with no traces of proteins and fats.

Product D; Fish oil with 15mg cholesterol, 0.5g saturated fat, 0.5g unsaturated fat and 300g omega-3 fatty acids.

Lilly, intends to buy a food supplement for her daughter who for a long time has shown signs of retarded growth, pot belly, wasted muscles, soft and weak hair and weak immunity.

Task

- a. Account for the signs and symptoms above and identify the likely deficiency disease Lilly’s child is suffering from.

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- b. Suggest the food supplement you would recommend Lilly can buy for her child and why.

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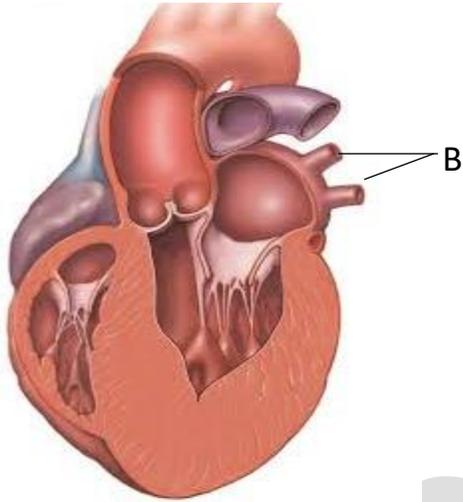
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- c. Explain how too much intake of **product D** can result in Atherosclerosis.

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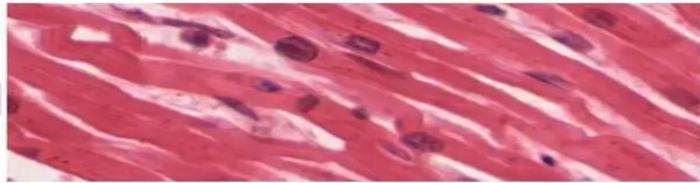
Support material.



(a)



(b)



(c)

a. Limb b. digestive system c. heart

Task

a. Identify the muscle types observed in the micrographs.

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b. Analyse the differences between the muscles in the limbs and those in the heart.

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JURUA

Student's Name:Stream.....

BIOLOGY

Paper 1

(Theory)

April, 2025

2 ½ hours

Uganda Advanced Certificate of Education

Midterm II Assessments

Biology

Paper 1

Senior Five

Time: 2 hrs

INSTRUCTIONS

This paper consists of 3 structured items.

Attempt all the items in the paper.

Answers to the items must be written in the spaces provided.

Answers should be written neatly with clear well labelled where necessary.

ITEMS	SCORES ATTAINED
1	
2	
3	