AQA GCSE Biology | 8461

SPECIFICATION POINT 4.4.1.3

Uses of glucose from photosynthesis

Past-paper questions

Tier	**Higher**
Question groups	**4**
Available paper years	**2008–2020**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.4.1.3 Uses of glucose from photosynthesis

Question 01

January 2008 | BLY3H | Original Q5 | Legacy

5 (a) Why is glucose found in the blood but not in the urine?
Use your knowledge of how the kidney works to explain your answer as fully as you can.

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(3 marks)

(b) The table shows the concentrations of dissolved substances in the urine of a healthy person and the urine of a person with one type of kidney disease.

Substance	Concentration in grams per dm^3	
	Urine of healthy person	Urine of person with kidney disease
Protein	0	6
Glucose	0	0
Amino acids	0	0
Urea	21	21
Mineral ions	19	19

(i) Suggest an explanation for the difference in composition of the urine between the healthy person and the person with the kidney disease.

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(2 marks)

4.4.1.3 Uses of glucose from photosynthesis

Question 01 · continued

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(ii) The person with the kidney disease could be treated either by using a dialysis machine or by having a kidney transplant operation.

What are the advantages and disadvantages of having a kidney transplant operation rather than dialysis?

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(4 marks)

9

4.4.1.3 Uses of glucose from photosynthesis

Question 02

June 2010 | BLY2H | Original Q1 | Legacy

1 This question is about photosynthesis.

1 (a) Plants make glucose during photosynthesis. Some of the glucose is changed into insoluble starch.

What happens to this starch?

Tick (✓) **one** box.

The starch is converted into oxygen. ☐

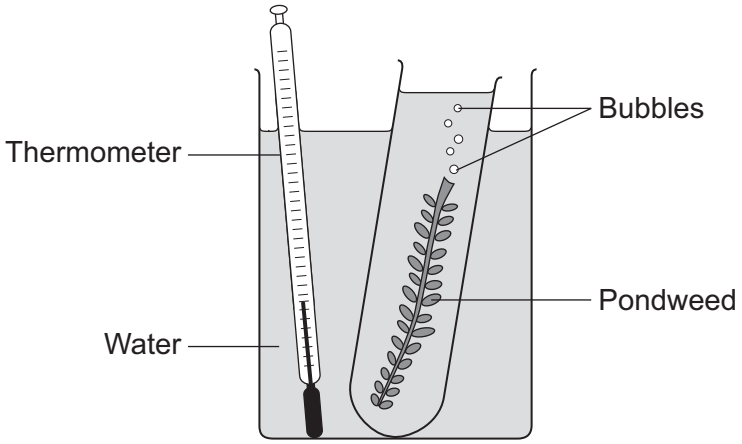
The starch is stored for later use. ☐

The starch is used to make the leaf green. ☐

(1 mark)

1 (b) A student investigated the effect of temperature on the rate of photosynthesis in pondweed.

The diagram shows the way the experiment was set up.



1 (b) (i) The student needed to control some variables to make the investigation fair.

State **two** of these variables.

1 .....

2 .....

(2 marks)

4.4.1.3 Uses of glucose from photosynthesis

Question 02 · continued

1 (b) (ii) The bubbles of gas are produced only while photosynthesis is taking place.

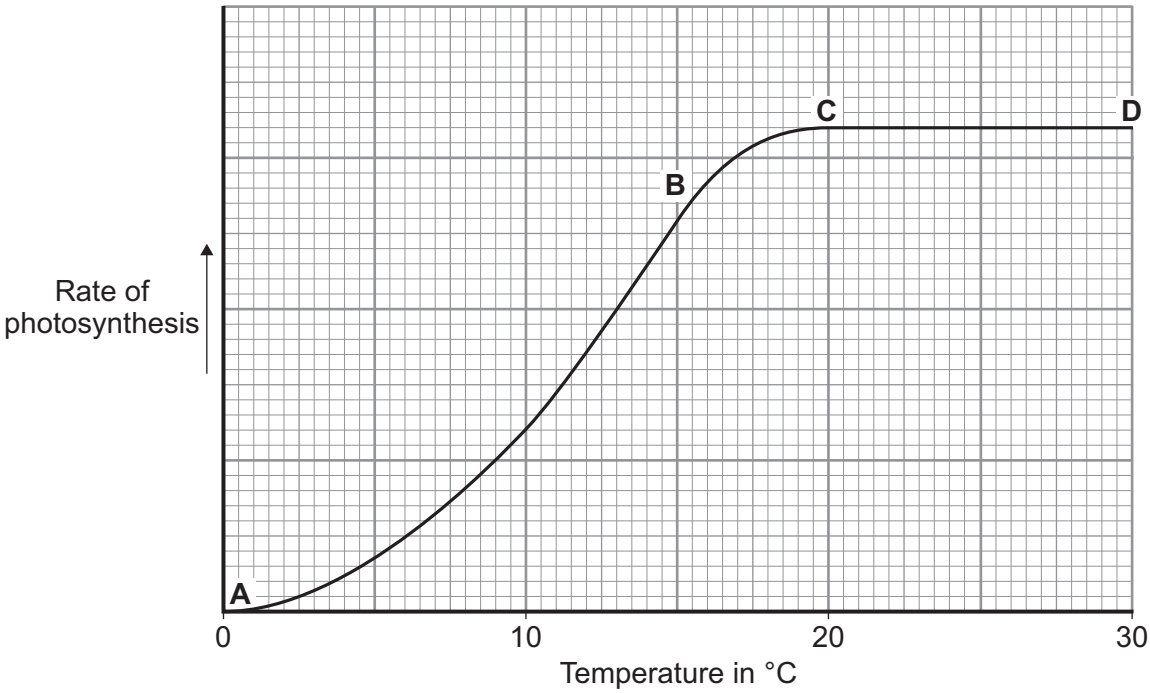
What **two** measurements would the student make to calculate the rate of photosynthesis?

1 .....

2 .....

(2 marks)

1 (c) The graph shows the effect of temperature on the rate of photosynthesis.



1 (c) (i) Name the factor that limits the rate of photosynthesis between the points labelled **A** and **B** on the graph.

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(1 mark)

1 (c) (ii) Suggest which factor, carbon dioxide, oxygen or water, might limit the rate of photosynthesis between the points labelled **C** and **D** on the graph.

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(1 mark)

7

4.4.1.3 Uses of glucose from photosynthesis

Question 03

June 2015 | BL2HP | Original Q7 | Legacy

7 Green plants can make glucose.

7 (a) Plants need energy to make glucose.

How do plants get this energy?

[2 marks]

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7 (b) Plants can use the glucose they have made to supply them with energy.

Give **four** other ways in which plants use the glucose they have made.

[4 marks]

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4.4.1.3 Uses of glucose from photosynthesis

Question 04

November 2020 | 8461/1H | Original Q4

0 4 . 1 Lipases break down lipids.

Which **two** products are formed when lipids are broken down?

[2 marks]

Tick (✓) **two** boxes.

- Amino acids ☐
- Fatty acids ☐
- Glucose ☐
- Glycerol ☐
- Glycogen ☐

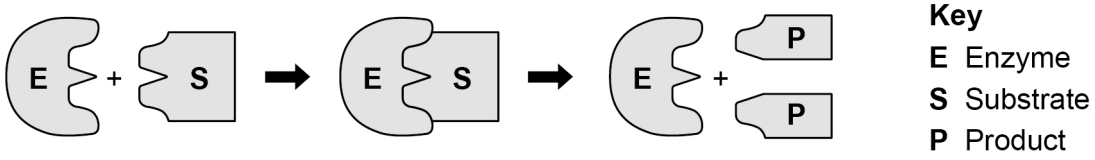
4.4.1.3 Uses of glucose from photosynthesis

Question 04 · continued

One model used to explain enzyme action is the 'lock and key theory'.

Figure 7 shows a model of the theory.

Figure 7



0 4 . 2 Explain the 'lock and key theory' of enzyme action.

Use information from **Figure 7** in your answer.

[3 marks]

0 4 . 3 There are many different types of lipase in the human body.

Why does each different type of lipase act on only **one** specific type of lipid molecule?

[1 mark]

4.4.1.3 Uses of glucose from photosynthesis

Question 04 · continued

Students investigated the presence of starch and glucose in the leaves of geranium plants.

This is the method used.

1. Place two identical geranium plants on a bench near a sunny window for two days.

2. After two days:
   - leave one plant near the window for two more days.
   - place one plant in a cupboard with no light for two more days.

3. Remove one leaf from each plant.

4. Crush each leaf to extract the liquid from the cells.

5. Test the liquid from each leaf for glucose and for starch.

0 4 . 4 Describe how the students would find out if the liquid from the leaf contained glucose.

[3 marks]

0 4 . 5 Describe how the students would find out if the liquid from the leaf contained starch.

[2 marks]

4.4.1.3 Uses of glucose from photosynthesis

Table 2 shows the students' results.

Table 2

Test	Leaf from plant kept in light for four days	Leaf from plant kept in light for two days and then no light for two days
Glucose	Strong positive	Weak positive
Starch	Positive	Negative

0 4 . 6 Explain why the leaf in the light for four days contained both glucose and starch.

[2 marks]

0 4 . 7 Explain why the leaf left in a cupboard with no light for two days did contain glucose but did **not** contain starch.

[3 marks]

0 4 . 8 Suggest **one** way the students could develop the investigation to find out more about glucose and starch production in plants.

[1 mark]

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