

GCSE Combined Science: Trilogy

Worksheet: Photosynthetic reaction

TIME 30 min	TOTAL 26 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
----------------	-------------------	-----------------------	----------------------------

Topics: Photosynthetic reaction

NAME	CLASS	DATE
------	-------	------

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

01

Photosynthesis takes place in green plants and algae.

01.1

Complete the word equation for photosynthesis.

carbon dioxide + → glucose +

.....

.....

.....

.....

[2 marks]

01.2

In which part of a plant cell does photosynthesis take place?

.....

.....

.....

[1 mark]

0 1 . 3

Which is the chemical formula of glucose?

Tick (✓) **one** box.

CO₂

☐

C₆H₁₂O₆

☐

H₂O

☐

O₂

☐

[1 mark]

0 1 . 4

Photosynthesis is an endothermic reaction.

What does endothermic mean?

.....

.....

[1 mark]

0 1 . 5

How is energy transferred to the chloroplasts for photosynthesis?

.....

.....

.....

[1 mark]

0 2

Photosynthesis is the process by which green plants and algae make glucose.

0 2 . 1

Which of these is a **product** of photosynthesis?

Tick (✓) **one** box.

Carbon dioxide

☐

Water

☐

Oxygen

☐

Nitrate ions

☐

[1 mark]

0 2 . 2

Photosynthesis is an endothermic reaction.
What does endothermic mean?

.....

.....

[1 mark]

0 2 . 3

Give the word equation for photosynthesis.

.....

.....

.....

.....

[2 marks]

0 3

A student wants to show that light is needed for photosynthesis using a leaf on a plant. Before the investigation, the plant is left in a dark cupboard for 48 hours. Part of one leaf is then covered with aluminium foil, and the plant is placed in bright light for several hours. The leaf is removed and tested for starch with iodine solution.

0 3 . 1

Explain why the plant is left in the dark for 48 hours before the investigation.

.....

.....

.....

.....

[2 marks]

0 3 . 2

Predict and explain the results of the iodine test on the covered and uncovered parts of the leaf.

.....

.....

.....

.....

[2 marks]

0 3 . 3

Suggest why the same leaf, rather than two different leaves, was used for the covered and uncovered parts.

.....

.....

[1 mark]

0 4

A student collected gas released by pondweed in bright light using an inverted test tube. After collecting enough gas, the student tested it with a glowing splint.

0 4 . 1

Describe the result you would expect from the glowing splint test if the gas is oxygen.

.....

.....

[1 mark]

0 4 . 2

Explain why this result supports the idea that pondweed produces oxygen during photosynthesis.

.....

.....

.....

.....

[2 marks]

0 4 . 3

Suggest why the student collected the gas in bright light rather than in the dark.

.....

.....

[1 mark]

0 5

Photosynthesis is described as an endothermic reaction.

0 5 . 1

Explain why photosynthesis is described as an endothermic reaction.

.....

.....

.....

.....

[2 marks]

0 5 . 2

Name the green substance in chloroplasts that absorbs light.

.....

.....

.....

.....

[1 mark]

0 5 . 3

Give the chemical formulae of the **two** reactants in photosynthesis.

.....

.....

.....

.....

[2 marks]

0 5 . 4

A student said, 'Plants get their food from the soil.'

Use your knowledge of photosynthesis to explain why the student is wrong.

.....

.....

.....

.....

[2 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Photosynthetic reaction · 26 marks

Question 1 (6 marks)

01.1 [2 marks]

Answer: carbon dioxide + water → glucose + oxygen

- water (1)
 - oxygen (1)
-

01.2 [1 mark]

Answer: Chloroplasts

- chloroplast (1)
-

01.3 [1 mark]

Correct: C₆H₁₂O₆

01.4 [1 mark]

- energy is transferred from the surroundings / is taken in (by the reaction) (1)
-

01.5 [1 mark]

Answer: By light

- by light (1)
-

Question 2 (4 marks)

02.1 [1 mark]

Correct: Oxygen

02.2 [1 mark]

- energy is transferred from the environment / surroundings (to the chloroplasts by light) (1)

Notes: Allow 'energy is taken in (from the surroundings)'.

02.3 [2 marks]

Answer: carbon dioxide + water → glucose + oxygen

- carbon dioxide + water (as the reactants) (1)
 - glucose + oxygen (as the products) (1)
-

Question 3 (5 marks)

03.1 [2 marks]

- to remove / use up any starch already present in the leaves (1)
 - so that any starch found later must have been made during the time in the light (1)
-

03.2 [2 marks]

- the uncovered part turns blue-black (positive for starch), because it photosynthesised in the light (1)
 - the covered part stays orange-brown (no starch), because it received no light, so could not photosynthesise (1)
-

03.3 [1 mark]

- using the same leaf controls other variables, e.g. leaf size, age or position on the plant, that could otherwise affect the amount of starch made (1)
-

Question 4 (4 marks)

04.1 [1 mark]

- the glowing splint relights / burns brightly (1)
-

04.2 [2 marks]

- the glowing splint test is a specific test for oxygen gas (1)
 - a positive result shows the gas collected was (mostly) oxygen, which is a product of photosynthesis (1)
-

04.3 [1 mark]

- photosynthesis, and so oxygen production, only happens in the light; in the dark only respiration would occur, which does not release oxygen (1)
-

Question 5 (7 marks)

05.1 [2 marks]

- energy is transferred from the environment / surroundings (1)
 - to the chloroplasts by light (1)
-

05.2 [1 mark]

Answer: Chlorophyll

- chlorophyll (1)
-

05.3 [2 marks]

Answer: CO₂ and H₂O

- CO₂ (1)
 - H₂O (1)
-

05.4 [2 marks]

- plants make their own food / glucose by photosynthesis (1)
 - from carbon dioxide (from the air) and water; the soil only supplies water and mineral ions (1)
-