

# COMBINED SCIENCE A

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OCR 2020  
GCSE Combined Science A  
(Gateway Science)

J250/01 Biology (Foundation Tier)  
With Marking Scheme Merged

Oxford Cambridge and RSA

**Friday 10 May 2024 – Morning**

**GCSE (9–1) Combined Science A  
(Gateway Science)**

**J250/01 Biology (Foundation Tier)**

**Time allowed: 1 hour 10 minutes**

**You must have:**

- a ruler (cm/mm)

**You can use:**

- a scientific or graphical calculator
- an HB pencil

\* J 2 5 0 0 1 \*

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

Candidate number

First name(s)

Last name

#### **INSTRUCTIONS**

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

#### **INFORMATION**

- The total mark for this paper is **60**.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in questions marked with an asterisk (\*).
- This document has **20** pages.

#### **ADVICE**

- Read each question carefully before you start your answer.

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12 Plants photosynthesise to produce food.

(a) Oxygen is a product of photosynthesis.

What are the **two** reactants in photosynthesis?

1 .....

2 .....

[2]

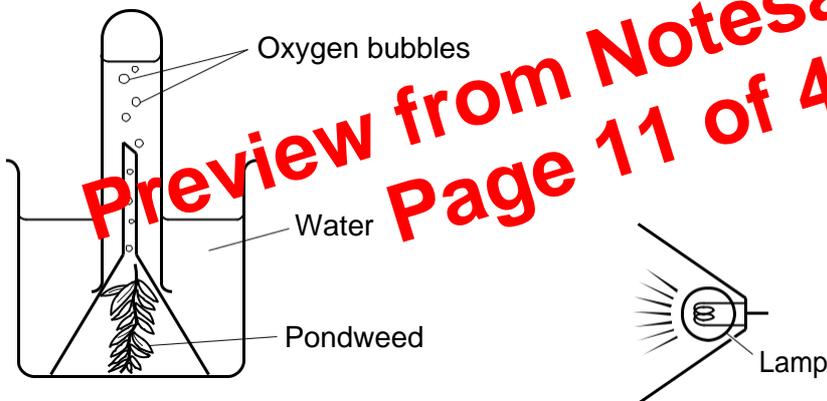
(b) Which statements about photosynthesis are **true** and which are

**false**? Tick (3) **one** box in each row.

	True	False
Carbohydrates are produced in photosynthesis.		
Photosynthesis is an exothermic reaction.		
Photosynthesis is a two-stage process.		
Photosynthesis takes place in the mitochondria.		

[2]

(c) The diagram shows apparatus used to investigate photosynthesis.



The number of oxygen bubbles released each minute indicate the rate of photosynthesis.

(i) A student counts the number of oxygen bubbles released from the pondweed. They count 23 bubbles in 3 minutes.

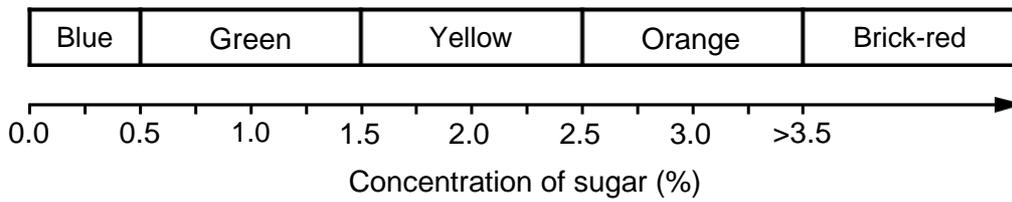
Calculate the rate of photosynthesis.

Give your answer to the **nearest whole number**.

Rate = ..... bubbles per minute [2]

(b) Fig. 16.2 is a chart that shows the colour of Benedict's solution after heating in different concentrations of sugar solution.

Fig. 16.2



The table shows the results recorded by the student.

Mixture of enzyme and starch	Colour of the Benedict's solution after heating	Sugar concentration in mixture (%)
A	brick-red	.....
B	blue	.....
C	orange	2.5 – 3.5
D	yellow	.....

(i) Complete the table.

[1]

(ii) The concentration of sugar in mixture C stated in the table is **not** an accurate value.

How can the student tell that it is **not** an accurate value?

..... [1]

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The breakdown of Assessment Objectives for GCSE (9-1) in Combined Science A:

	<b>Assessment Objective</b>
<b>AO1</b>	<b>Demonstrate knowledge and understanding of scientific ideas and scientific techniques and procedures.</b>
AO1.1	Demonstrate knowledge and understanding of scientific ideas.
AO1.2	Demonstrate knowledge and understanding of scientific techniques and procedures.
<b>AO2</b>	<b>Apply knowledge and understanding of scientific ideas and scientific enquiry, techniques and procedures.</b>
AO2.1	Apply knowledge and understanding of scientific ideas.
AO2.2	Apply knowledge and understanding of scientific enquiry, techniques and procedures.
<b>AO3</b>	<b>Analyse information and ideas to interpret and evaluate, make judgements and draw conclusions and develop and improve experimental procedures.</b>
<b>AO3.1</b>	Analyse information and ideas to interpret and evaluate.
AO3.1a	Analyse information and ideas to interpret.
AO3.1b	Analyse information and ideas to evaluate.
<b>AO3.2</b>	Analyse information and ideas to make judgements and draw conclusions.
AO3.2a	Analyse information and ideas to make judgements.
AO3.2b	Analyse information and ideas to draw conclusions.
<b>AO3.3</b>	Analyse information and ideas to develop and improve experimental procedures.
AO3.3a	Analyse information and ideas to develop experimental procedures.
AO3.3b	Analyse information and ideas to improve experimental procedures.

Question		Answer	Marks	AO element	Guidance
14	(a) (i)	<p>First check the answer in the table If answer = 2:1 award 2 marks</p> <p>[54 ÷ 27] or 2 ✓</p> <p>=2:1 ✓</p>	2	1.2  2.2	<p><b>ALLOW</b> correct answer written outside table, but answer in table takes precedence</p> <p><b>ALLOW</b> 6:3 or other correct ratio for one mark as alternative to [54 ÷ 27] if no calculation stated <b>DO NOT ALLOW:</b> 54:27</p>
	(ii)	<p>First result/122 was an anomaly/higher / did not fit the pattern / was too low/was lower than A / was too quick/was quicker than A</p>	1	3.1b	AW

Question		Answer	Marks	AO element	Guidance
	(c)	<p>Increases (transport) ✓</p> <p>Increased transpiration  <b>Or</b>                      Increased evaporation of water from leaf cells                      Or                      Increased diffusion of water vapour through stomata ✓</p>	2	<p>2.1</p> <p>1.1</p>	<p>Assume answer refers to a warm day unless otherwise stated</p> <p><b>ALLOW</b> it will increase/ be faster / be quicker  <b>ALLOW</b> water uptake is faster  <b>IGNORE</b> transport will be more efficient / references to kinetic energy</p> <p><b>ALLOW</b> more evaporation from leaves</p> <p><b>ALLOW</b> more water evaporates through the stomata / more water vapour escapes through the stomata</p>

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