AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.8.2.2

Test for oxygen

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**3**
Available paper years	**2019–2025**

Using this booklet

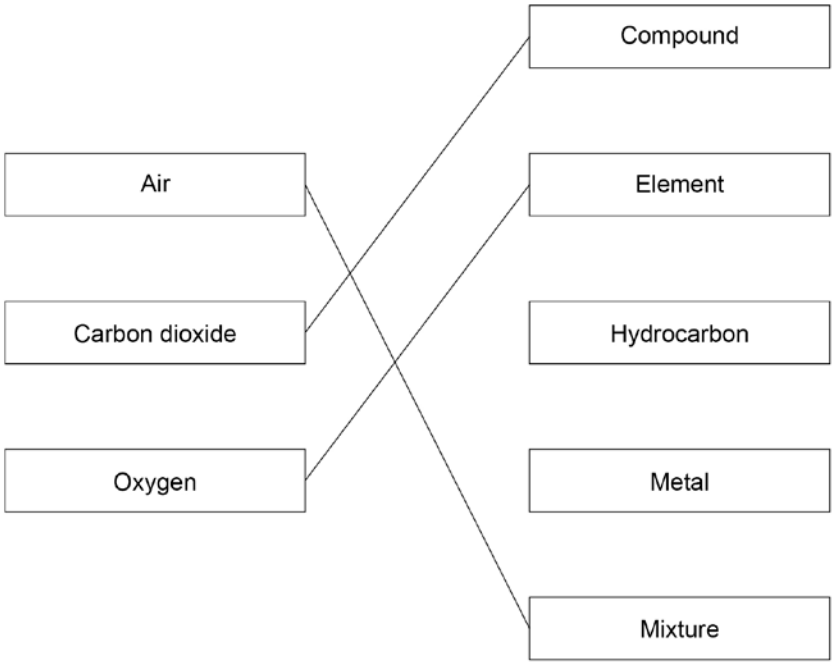
1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

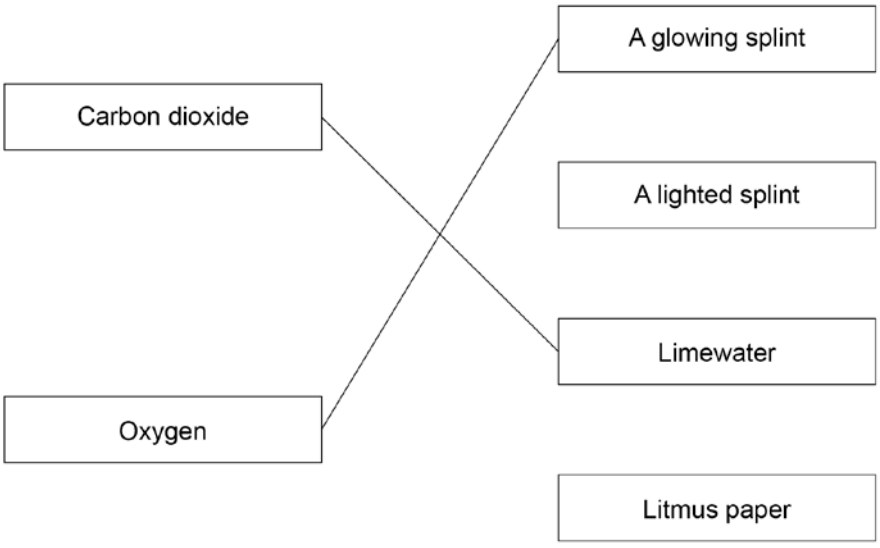
Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

5.8.2.2 Test for oxygen

Answer 01 · Mark scheme June 2019 | 8464/C/2F | Original Q1

01.1	 If more than one line is drawn from any one substance and not crossed out, no mark is given for that substance. The other marks can be awarded.	1 1 1	AO2.1 5.1.1.2 5.8.1.1 5.1.1.1

01.2	 If more than one line is drawn from any one gas and not crossed out, no mark is awarded for that gas. The other mark can be awarded.	1 1	AO1.1 5.8.2.2 5.8.2.3

01.3	dissolved in oceans photosynthesis		1 1	AO1 5.9.1.2 5.9.1.4

5.8.2.2 Test for oxygen

Answer 01 · Mark scheme

June 2019 | 8464/C/2F | Original Q1

01.4	⇌	ignore any other words, formulae or symbols	1	AO1.1 5.6.2.1
01.5	endothermic (reaction)	spelling must be correct do **not** accept exothermic	1	AO1.1 5.6.2.2
01.6	rate (of reaction)	allow speed or velocity do **not** accept any other response	1	AO1 5.6.2.3
Total			**10**	

5.8.2.2 Test for oxygen

Answer 01 · Mark scheme

June 2019 | 8464/C/2F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.

5.8.2.2 Test for oxygen

Answer 02 · Mark scheme

June 2022 | 8464/C/2F | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	bar drawn to 21%		1	AO2 5.9.1.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	a glowing splint		1	AO1 5.8.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	(nitrogen) increased (oxygen) increased		1 1	AO2 5.9.1.2 5.9.1.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	dissolved in oceans formation of sedimentary rocks		1 1	AO1 5.9.1.2 5.9.1.4

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Answer 02 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	9 (am) 5 (pm)	allow 0900 allow 1700	1 1	AO2 5.9.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	more cars / buses / lorries on the roads		1	AO3 5.9.3.1

Total Question 1		**9**

5.8.2.2 Test for oxygen

Answer 03 · Mark scheme

June 2025 | 8464/C/2F | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	(test) glowing splint (result) relights	do **not** accept burning / lit splint allow glows more brightly MP2 is dependent upon MP1 being awarded	1 1	AO1 5.8.2.2

5.8.2.2 Test for oxygen

Answer 03 · Mark scheme

Question	Answers	Mark	AO / Spec. Ref.
06.2	**Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO1
	Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	AO1
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO3
	No relevant content	0	5.9.1.1 5.9.1.2 5.9.1.3 5.9.1.4
	Indicative content • **the percentage of carbon dioxide has decreased** ○ (because) carbon dioxide dissolved in the oceans ○ forming sediments ○ (because) algae / plants ○ photosynthesised ○ by the formation of sedimentary rocks ○ by the formation of fossil fuels • **the percentage of nitrogen has increased** ○ (because) volcanic activity produced nitrogen ○ denitrifying bacteria released nitrogen • **the percentage of oxygen has increased** ○ (because) algae / plants ○ photosynthesised for **Level 3** answers must include each of the gases with an explanation for different gases		

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	any **two** from: • reduce livestock farming • reduce the number of rice / paddy fields • reduce the amount of rubbish going to landfill • use methane from landfill as an energy source • reduce fossil fuel use • reduce the destruction of peat bogs	 allow reduction of specific animals / product allow reduce area of wetlands allow recycle more (so less rubbish to landfill)	2	AO1 5.9.2.2 5.9.2.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	fossil fuels (containing sulfur) are burnt sulfur reacts with oxygen (to produce sulfur dioxide)	allow fuels containing sulfur are burnt	1 1	AO1 5.9.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.5	any **one** from: • respiratory problems • acid rain	 allow immediate consequence of acid rain	1	AO1 5.9.3.2

5.8.2.2 Test for oxygen

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.6	any **one** from: • less use of fossil fuels (containing sulfur) • sulfur is removed from fossil fuels (before burning) • sulfur dioxide is removed from waste gases (after burning) • new legislation / regulations (since 1980)	allow any named fossil fuel allow less use of fuels containing sulfur allow increased use of renewable energy allow increased use of electric vehicles	1	AO3 5.9.3.1
Total Question 6			**14**	

5.8.2.2 Test for oxygen

Answer 02 · Examiner comments — June 2022 | 8464/C/2F | Original Q1

Question 1

A straightforward introduction to the paper which mainly relied on interpreting supplied information.

01.1 Only about half of all students achieved this mark. Many students misinterpreted the scale on the *y*-axis and drew the line at 22% rather than 21%. There was no tolerance allowed on this graph for that reason. It is advised that students bring a ruler to their exams to use when drawing bar charts.

01.2 Many students knew that a burning splint is required to test for oxygen in this question.

01.3 Information taken from the pie charts was answered correctly by most students, with over half gaining 2 marks and 95% gaining at least 1 mark.

01.4 Another question testing knowledge of specification content that was not always well known with just over 60% of students gaining at least 1 mark.

01.5 Almost all students answered this correctly gaining 2 marks. The most common incorrect responses stated the concentrations at the peaks rather than the times.

Answer 02 · Examiner comments — June 2022 | 8464/C/2F | Original Q1

01.6 The mark scheme required a link between increased use of transport at these times and the emissions of oxides of nitrogen, with approximately a third of students recognising this. Students should be encouraged to read the stem of each question.

5.8.2.2 Test for oxygen

Answer 03 · Examiner comments

June 2025 | 8464/C/2F | Original Q6

Question 6 (Standard demand)

06.1 The test for oxygen was not well known, there were a lot of blank scripts. Those who did attempt the question often referred to lit or burning splints, or sometimes both glowing and lit together. Also, a significant number of students referred to smouldering splints, or splints that had been previously lit as opposed to a glowing splint. This standard test needs to reference 'glowing'. A splint that has been previously lit and then blown out is not equivalent.
The most common incorrect response was students attempting to describe the test for hydrogen, with students referencing the squeaky pop test.

06.2 This was an 'extended response' style of question. Such questions are marked holistically. There are overall generic descriptions for the three levels of response at the top of the mark scheme, giving a hierarchy of response. Within each level there are 2 marks.

Simply quoting the data from the table was not creditworthy. Students who did not use comparative language, such as higher, lower, only or just, to compare percentages failed to gain credit. Quoted figures needed to be correct.

Simple comparative statements limited the student to Level 1.

To access Level 2, the student had to offer at least two comparisons of percentage composition along with some correctly linked explanations, although all three gases did not have to be addressed.

To access Level 3 students had to correctly identify the change in percentage composition for all three gases from the early atmosphere to the current day and explain at least two of them.

Many students simply copied out the given information and therefore failed to gain any marks. The majority of the responses were in Level 1, as students failed to explain how the changes that they had described, came about. Where they did, contradictions were made, and the credit was disqualified. Where credit was given, it was mainly as a result of a description of plants photosynthesising.

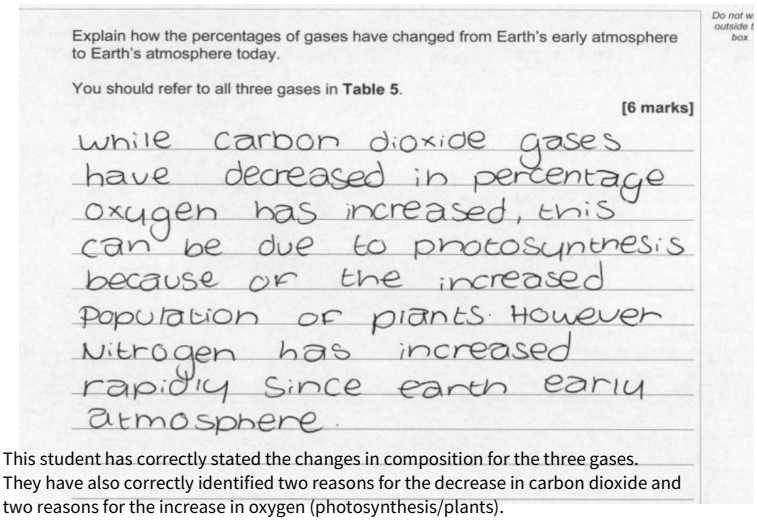
A significant number of students attempted to explain the changes in terms of climate change and the burning of fossil fuels, increased transport and pollution.

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5.8.2.2 Test for oxygen

Answer 03 · Examiner comments

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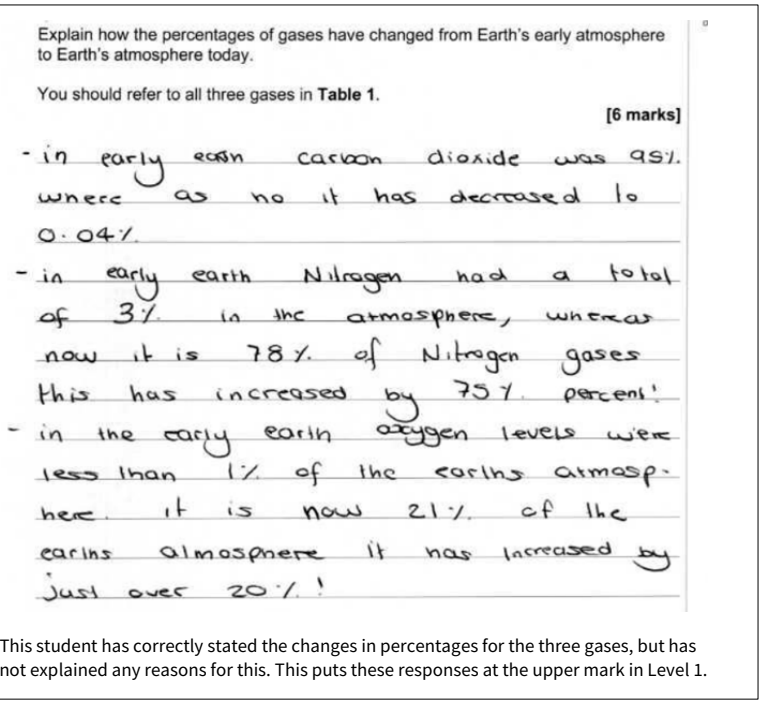
Explain how the percentages of gases have changed from Earth's early atmosphere to Earth's atmosphere today.

You should refer to all three gases in **Table 5**.

[6 marks]

while carbon dioxide gases have decreased in percentage oxygen has increased, this can be due to photosynthesis because of the increased population of plants. However Nitrogen has increased rapidly since earth early atmosphere.

This student has correctly stated the changes in composition for the three gases.
They have also correctly identified two reasons for the decrease in carbon dioxide and two reasons for the increase in oxygen (photosynthesis/plants).
This achieves the lower mark in Level 3.



Explain how the percentages of gases have changed from Earth's early atmosphere to Earth's atmosphere today.

You should refer to all three gases in **Table 1**.

[6 marks]

- in early earth carbon dioxide was 95% where as no it has decreased to 0.04%.
- in early earth Nitrogen had a total of 3% in the atmosphere, whereas now it is 78% of Nitrogen gases this has increased by 75% percent!
- in the early earth oxygen levels were less than 1% of the earths atmosphere. it is now 21% of the earths atmosphere it has increased by just over 20%!

This student has correctly stated the changes in percentages for the three gases, but has not explained any reasons for this. This puts these responses at the upper mark in Level 1.

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06.3 Many students appreciated that cattle farming leads to methane emissions but did not always refer to a reduction in this type of farming being required. There were many responses that answered as an absolute rather than a comparison which was insufficient for the mark. The question was looking for the idea that 'less' farming of livestock or 'less' use of fossil fuels would reduce methane for example, not stopping farming or stopping the use of fossil fuels altogether.

As they were told that methane is a greenhouse gas, some students confused the reduction of methane emissions with that of carbon dioxide and made suggestions such as planting more trees or burying methane underground.

06.4 How sulfur dioxide is released into the atmosphere was not well known, resulting in many blank scripts.
The most common insufficient response for marking point 1 was that 'fuels', rather than 'fossil fuels', were being burnt. Many students referred to the use of cars but did not link this to the burning of fossil fuels.
Students trying to explain the formation of sulfur dioxide often referred to the sulfur reacting with carbon dioxide rather than with oxygen. Very few students gained 2 marks.

06.5 Less than 20% of students could recall any problem associated with sulfur dioxide. There were many vague answers such as its toxic, causing difficulty in breathing, causing cancer, climate change, global warming, harms the environment and burns the skin. None of which gained any credit.
Acid rain was rarely mentioned and the correct terminology of 'respiratory' problems even less so.

0 6 . 5 Give **one** harmful effect of sulfur dioxide emissions. **[1 mark]**

Struggle to breathe properly.

The student has tried to offer a creditworthy response but has used incorrect terminology.
The question is looking for 'respiratory issues/problems' as opposed to breathing.
This is a higher demand question and correct terminology is required.

06.6 Students found this question difficult.
A common misconception appeared to be that sulfur itself is used as a fuel and we now do not use it as much.
Some students did attempt to link the reduction in sulfur dioxide to the use of electric vehicles. The common error here however was that they had to clearly imply 'increased' use of electric vehicles, and most did not.

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5.8.2.2 Test for oxygen

Answer 03 · Examiner comments

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Contact us

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