AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.10.1.1

# Using the Earth's resources and sustainable development

## Mark schemes and examiner comments

| | |
|---|---|
| Tier | **Higher** |
| Question groups | **1** |
| Available paper years | **2025–2025** |

## 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.

5.10.1.1 Using the Earth's resources and sustainable development

Answer 01 · Mark scheme

June 2025 | 8464/C/2H | Original Q3

## Question 3

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| 03.1 | (a resource that) will run out | allow (a resource that) is non-renewable | 1 | AO1<br>5.7.1.1<br>5.10.1.1 |

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| 03.2 | (a compound / molecule) made up of carbon and hydrogen (atoms) only | | 1 | AO1<br>5.7.1.1 |

5.10.1.1 Using the Earth's resources and sustainable development

Answer 01 · Mark scheme



| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| 03.3 | (volume of petrol =) $90 \times 159 \times \frac{31.3}{100}$<br>**or**<br>(volume of petrol =) $14310 \times \frac{31.3}{100}$<br>**or**<br>(volume of petrol =) $90 \times 49.767$<br>**or**<br>(volume of petrol =) $28.17 \times 159$ | allow **1** mark for<br>$90 \times 159$<br>**or**<br>$159 \times \frac{31.3}{100}$<br>**or**<br>$90 \times \frac{31.3}{100}$ | 2 | AO2<br>5.7.1.1<br>5.7.1.2 |
| | = 4479.03 | | 1 | |
| | = 4480 ($dm^3$) | allow an answer correctly rounded to 3 significant figures from an incorrect calculation which uses 90 barrels, 159 $dm^3$ and a fraction percentage | 1 | |

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **03.4** | lubricants | | 1 | AO1<br>5.7.1.2 |

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **03.5** | steam cracking | | 1 | AO1<br>5.7.1.4 |

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **03.6** | (test)<br>add bromine water<br><br>(result)<br>(bromine) changes (from orange) to colourless | <br><br><br>allow (bromine) is decolourised | <br>1<br><br><br>1 | AO2<br>5.7.1.4 |

| **Total Question 3** | **10** |
|---|---|

## 5.10.1.1 Using the Earth's resources and sustainable development

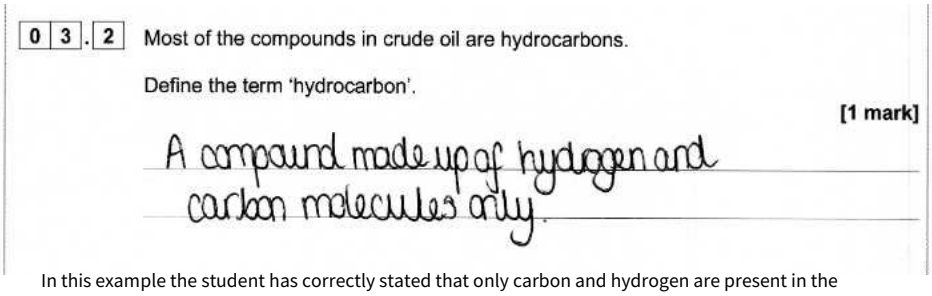
**Answer 01 · Examiner comments**

June 2025 | 8464/C/2H | Original Q3

# Question 3 (Standard and Standard /High demand)

**03.1** The majority of students could explain that a finite resource is one that will run out. The most common incorrect responses were linked to either it 'taking a long time to make more' or 'using it up too fast', neither being sufficient for the mark.

**03.2** While the majority of students correctly identified hydrogen and carbon, the mark could often not be credited because it was not made clear that these were the *only* atoms present. A significant number of students used the incorrect terminology for describing a compound/molecule or an atom. Subsequently only half of all students were credited the mark.



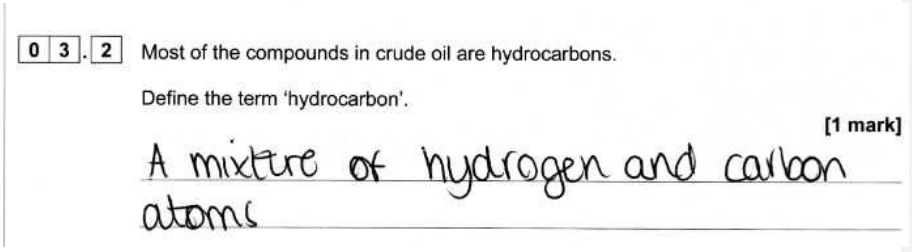

In this example the student has correctly stated that only carbon and hydrogen are present in the compound but have incorrectly called the particles 'molecules' rather than 'atoms', so the mark cannot be awarded.

© 2024 AQA and its licensors. All rights reserved.

## 5.10.1.1 Using the Earth's resources and sustainable development

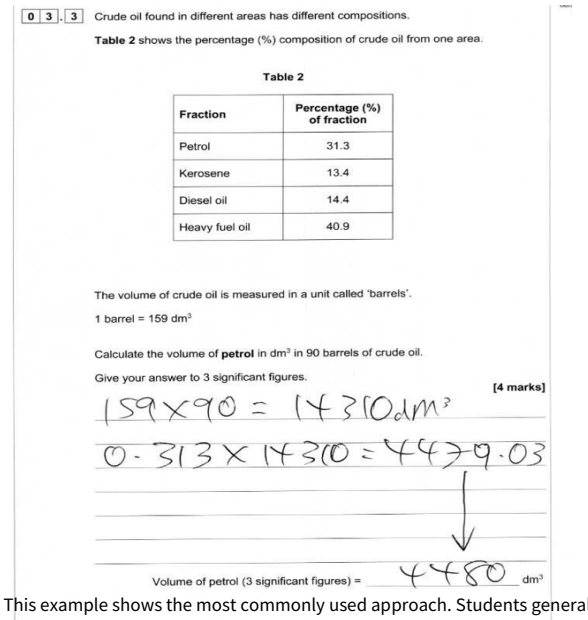
**Answer 01 · Examiner comments**

June 2025 | 8464/C/2H | Original Q3




In this example the student has incorrectly used the terminology 'mixture' rather than 'compound' and have failed to state that hydrogen and carbon are the **only** atoms there, no marks were awarded.

**03.3** The large majority of students attempted this question, and a variety of different approaches were seen, with over half of students gaining all four marks. Students not gaining full marks, were often able to identify which values they needed to use but were not so confident in using them correctly. A significant number failed to give their answer correctly rounded to 3 significant figures.




This example shows the most commonly used approach. Students generally showed good mathematical skills in this question. The total volume of oil in 90 barrels is first calculated, followed by then working out 31.3% of this value. The answer is then correctly rounded to 3 significant figures. 4 marks awarded.

© 2024 AQA and its licensors. All rights reserved.

## 5.10.1.1 Using the Earth's resources and sustainable development

**Answer 01 · Examiner comments**

June 2025 | 8464/C/2H | Original Q3

**03.4** By selecting lubricants, over half of students answered correctly. The most common incorrect response was fertilisers.

**03.5** Less than half of students could recall the correct method. Students who did not gain credit generally confused other processes involving hydrocarbons and often referred to fractional distillation. A significant number just wrote 'steam' which is not a method and therefore did not gain credit.

**03.6** Only half of all students gained credit in this question. The majority of students who could recall bromine water as the required test then went on to successfully state the correct colour change, to colourless. Bromine alone was insufficient for the mark, although students were allowed a mark for the correct result if they went down this path. A significant number of students were not able to recall the test and often confused it with limewater leading to a cloudy solution.