AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.10.1.1

Using the Earth's resources and sustainable development

Past-paper questions

Tier	**Foundation**
Question groups	**4**
Available paper years	**2019–2025**

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.

5.10.1.1 Using the Earth's resources and sustainable development

Question 01

June 2019 | 8464/C/2F | Original Q4

0 4 Large hydrocarbon molecules can be cracked to produce smaller, more useful molecules.

Alkanes and alkenes are produced when hydrocarbons are cracked.

0 4 . 1 Give **two** conditions used for cracking.

[2 marks]

1 _____

2 _____

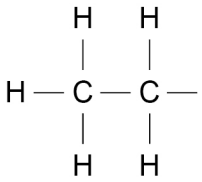
0 4 . 2 Butane (C_4H_{10}) is an alkane.

Figure 5 shows part of the displayed structural formula of butane.

Complete the displayed structural formula of butane in **Figure 5**.

[1 mark]

Figure 5



0 4 . 3 Butane burns in oxygen.

Complete the word equation for the complete combustion of butane.

[2 marks]

butane + oxygen → _____ + _____

Question 4 continues on the next page

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Question 01 · continued June 2019 | 8464/C/2F | Original Q4

0 4 . 4 Ethene is an alkene.

Give a test for alkenes.

Give the result of the test if an alkene is present.

[2 marks]

Test _____

Result _____

_____

0 4 . 5 Each year many tonnes of crude oil are extracted from the Earth.

It took millions of years for the crude oil to be formed.

What do we call development that meets the needs of current generations without compromising the resources for future generations?

[1 mark]

Tick (✓) **one** box.

Finite development ☐

Global development ☐

Natural development ☐

Sustainable development ☐

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Question 02

June 2023 | 8464/C/2F | Original Q1

0 1 Crude oil contains a large number of hydrocarbons.

0 1 . 1 Crude oil is a finite resource.

What is a finite resource?

[1 mark]

Tick (✓) **one** box.

A limited resource ☐

A renewable resource ☐

A sustainable resource ☐

0 1 . 2 What is crude oil formed from?

[1 mark]

Tick (✓) **one** box.

Plankton ☐

Volcanoes ☐

Water ☐

5.10.1.1 Using the Earth's resources and sustainable development

Question 02 · continued

0 1 . 3 What type of substance is crude oil?

[1 mark]

Tick (✓) **one** box.

Compound ☐

Element ☐

Mixture ☐

0 1 . 4 The hydrocarbons in crude oil are separated into fractions using fractional distillation.

Complete the sentences.

Choose answers from the box.

[2 marks]

condense	**evaporate**	**freeze**	**melt**

In fractional distillation the crude oil is heated so

the hydrocarbons _____ .

The fractions collect as the hydrocarbons cool and _____ .

Question 1 continues on the next page

5.10.1.1 Using the Earth's resources and sustainable development

Question 02 · continued

Hydrocarbons can be cracked to produce more useful molecules.

0 1 . 5 Complete the sentence.

Choose the answer from the box.

[1 mark]

alloys	**fertilisers**	**fuels**

Some products of cracking are useful as _____ .

0 1 . 6 Hydrogen gas is a product of cracking.

What is used in the test for hydrogen gas?

[1 mark]

Tick (✓) **one** box.

Burning splint ☐

Glowing splint ☐

Limewater ☐

5.10.1.1 Using the Earth's resources and sustainable development

Question 02 · continued

0 1 . 7 5.20 kg of crude oil contains 1.53 kg of LPG (Liquefied Petroleum Gas).

Calculate the percentage (%) of LPG in 5.20 kg of crude oil.

Give your answer to 3 significant figures.

[3 marks]

Percentage (3 significant figures) = _____ %

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Turn over for the next question

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Question 03

0 5 Life cycle assessments (LCAs) are used to assess the environmental impact of different products.

0 5 . 1 212 million kilograms of aluminium is used for packaging in the UK each year.

68.0% of aluminium packaging is recycled.

Calculate the mass of aluminium packaging that is recycled in the UK each year.

[2 marks]

Mass of aluminium recycled = _____ million kg

0 5 . 2 Drinks cans are made from aluminium.



An aluminium can has a mass of 15.8 g.

1000 g = 1 kg

Calculate the **whole number** of aluminium cans that can be made from 4.00 kg of aluminium.

[4 marks]

Whole number of cans = _____

Question 5 continues on the next page

5.10.1.1 Using the Earth's resources and sustainable development

Question 03 · continued

0 5 . 3 **Table 5** shows three methods used to dispose of wood and steel after use.

Table 5

	Percentage (%) of material disposed of by each method		
	As waste	**Recycled**	**Burnt**
Wood	58	36	6
Steel	15	85	0

Evaluate the sustainability of the disposal of wood and steel.

[4 marks]

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Question 04

0 4 Humans use many different resources.

Water is an important natural resource.

0 4 . 1 What is meant by 'potable water'?

[1 mark]

Tick (✓) **one** box.

- Water from the ground ☐
- Water that is pure ☐
- Water that is safe to drink ☐

0 4 . 2 Waste water needs treatment before the water is put back into rivers and the sea.

The first stage of waste water treatment is to pass the waste water through metal grids.

Why is the waste water passed through metal grids?

[1 mark]

Tick (✓) **one** box.

- To remove dissolved salts ☐
- To remove large solid objects ☐
- To remove microbes ☐
- To remove oxygen gas ☐

5.10.1.1 Using the Earth's resources and sustainable development

Question 04 · continued

Clothes can be made from different materials.

Some clothes are made from wool and some clothes are made from poly(propene).

0 4 . 3 One sheep produces 4.5 kg of wool.

50 g of wool is needed to make a hat.

Calculate the number of hats that can be made from the wool of one sheep.

1 kg = 1000 g

[3 marks]

Number of hats = _____

5.10.1.1 Using the Earth's resources and sustainable development

Question 04 · continued

0 4 . 4 **Table 4** gives information about poly(propene) and wool.

Table 4

	Poly(propene)	Wool
Source of material	Crude oil	Sheep
Level of insulation	High	Medium
Cost	Low	High
Durability	High	Medium

Explain the advantages of using poly(propene) and of using wool for clothing.

[4 marks]

Extra space

Question 4 continues on the next page

Question 04 · continued

0 4 . 5 After being used, clothes can be:

- given to other people to wear
- used to make insulation blocks for buildings.

Complete the sentences.

Choose answers from the box.

[2 marks]

recycled	**reduced**	**released**	**reused**	**reversed**

When clothes are given to other people to wear,

the clothes are _____.

When clothes are used to make insulation blocks for buildings,

the clothes are _____.

5.10.1.1 Using the Earth's resources and sustainable development

Question 04 · continued

Poly(propene) is made from an alkene.

Alkenes are produced by cracking alkanes.

0 4 . 6 A high temperature is used for cracking alkanes.

Which **two** of the following can also be used to crack alkanes?

[2 marks]

Tick (✓) **two** boxes.

- A catalyst ☐
- A solvent ☐
- Carbon dioxide ☐
- Steam ☐
- Sulfuric acid ☐

0 4 . 7 Which chemical is used to test for alkenes?

[1 mark]

Tick (✓) **one** box.

- Ammonia ☐
- Bromine water ☐
- Copper sulfate ☐
- Nitrogen ☐

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