AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.10.2.2

Ways of reducing the use of resources

Past-paper questions

Tier	**Foundation**
Question groups	**4**
Available paper years	**2021–2025**

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.

5.10.2.2 Ways of reducing the use of resources

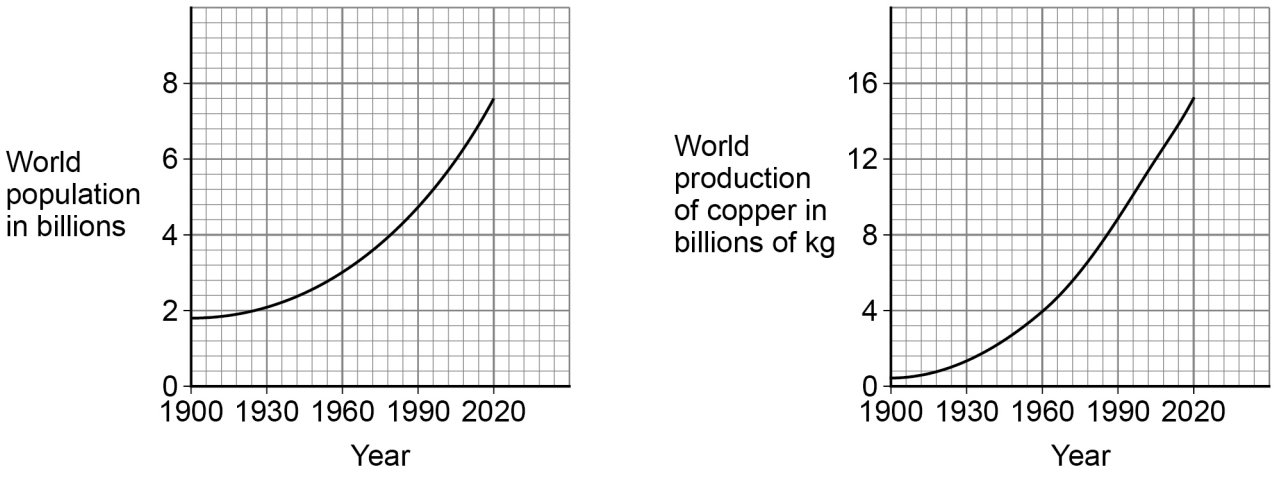
Question 01

November 2021 | 8464/C/2F | Original Q5

0 5 Industries use the Earth's resources to produce useful products.

0 5 . 1 **Figure 4** shows the world population and the world production of copper between 1900 and 2020.

Figure 4



How does the change in the world population compare with the world production of copper?

[1 mark]

Tick (✓) **one** box.

As population decreased, copper production increased. ☐

As population increased, copper production decreased. ☐

As population increased, copper production increased. ☐

5.10.2.2 Ways of reducing the use of resources

Question 01 · continued

Copper is produced from copper ore and from recycling waste copper.

0 5 . 2 The energy needed to produce 1 kg of copper from copper ore is 70 MJ.

The energy needed to produce 1 kg of recycled copper is 27 MJ.

Calculate the energy saved if 100 kg of copper is produced from recycled copper and **not** from copper ore.

[3 marks]

Energy saved = _____ MJ

0 5 . 3 Producing copper from recycling waste copper reduces emissions of sulfur dioxide.

Why is reducing emissions of sulfur dioxide important?

[1 mark]

0 5 . 4 Copper is used to make coins.

A coin of mass 8 g contains 75% copper.

Calculate the mass of copper in the coin.

[2 marks]

Mass of copper = _____ g

5.10.2.2 Ways of reducing the use of resources

0 5 . 5 Iron and glass are both produced from the Earth's resources.

Some processes can reduce the use of limited resources.

Draw **one** line from the description of the process to the name of the process.

[2 marks]

Description of process	Name of process
	Extraction
Scrap steel is added to iron from a blast furnace	Quarrying
	Reacting
A glass bottle is refilled	Recycling
	Reusing

5.10.2.2 Ways of reducing the use of resources

Question 01 · continued

0 5 . 6 Life cycle assessments are used to assess the environmental impact of producing iron nails and glass bottles.

There are four stages, **A**, **B**, **C** and **D**, in a life cycle assessment.

The stages are **not** in the correct order.

Stage **A** Disposal

Stage **B** Extracting and processing raw materials

Stage **C** Manufacturing and packaging

Stage **D** Use and operation

What is the correct order of stages **A**, **B**, **C**, and **D**?

[1 mark]

Tick (✓) **one** box.

C, **D**, **B**, **A** ☐

D, **B**, **C**, **A** ☐

B, **C**, **D**, **A** ☐

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5.10.2.2 Ways of reducing the use of resources

Question 02

0 2 The Earth's atmosphere is always changing.

0 2 . 1 Gases in the Earth's early atmosphere caused changes on the Earth.

Draw **one** line from each change to the gas that caused the change.

[2 marks]

Change	Gas that caused the change
Oceans formed	Ammonia
Sedimentary rocks formed	Carbon dioxide
	Nitrogen
	Oxygen
	Water vapour

5.10.2.2 Ways of reducing the use of resources

Question 02 · continued

Table 1 shows the percentage of some gases in the atmospheres of Earth and Mars today.

Table 1

Gas	Percentage of gas in atmosphere (%)	
	Earth	Mars
Argon	0.90	1.9
Carbon dioxide	0.04	95
Nitrogen	78	2.6
Oxygen	21	0.20

0 2 . 2 Which gas has the highest percentage in the Earth's atmosphere?

[1 mark]

0 2 . 3 Calculate how many times more carbon dioxide there is in the atmosphere of Mars than in the atmosphere of Earth.

Use **Table 1**.

Give your answer in standard form.

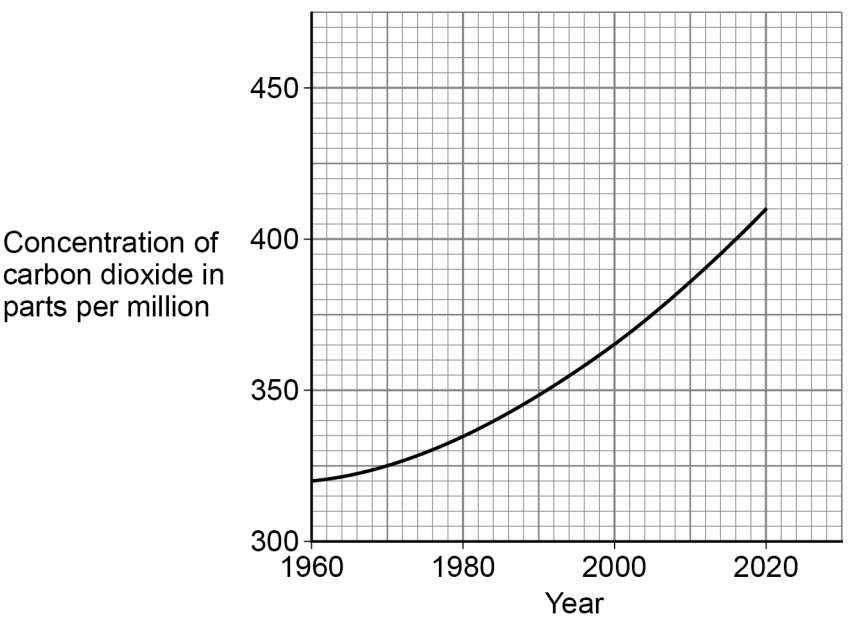
[3 marks]

Number of times more carbon dioxide (in standard form) = _____

Carbon dioxide is a greenhouse gas.

0 2 . 4 **Figure 1** shows the concentration of carbon dioxide in the Earth's atmosphere from 1960 to 2020.

Figure 1



How has the concentration of carbon dioxide in the Earth's atmosphere changed from 1960 to 2020?

[1 mark]

Tick (✓) **one** box.

Decreased ☐

Stayed the same ☐

Increased ☐

5.10.2.2 Ways of reducing the use of resources

Question 02 · continued

0 2 . 5 Cars emit carbon dioxide.

A car emits 17.2 kg of carbon dioxide on a journey.

There are four people in the car.

Calculate the mass of carbon dioxide emitted per person.

[2 marks]

Mass of carbon dioxide = _____ kg

0 2 . 6 Planting trees helps to reduce climate change, because trees use carbon dioxide from the Earth's atmosphere.

Name the process in trees which uses carbon dioxide.

[1 mark]

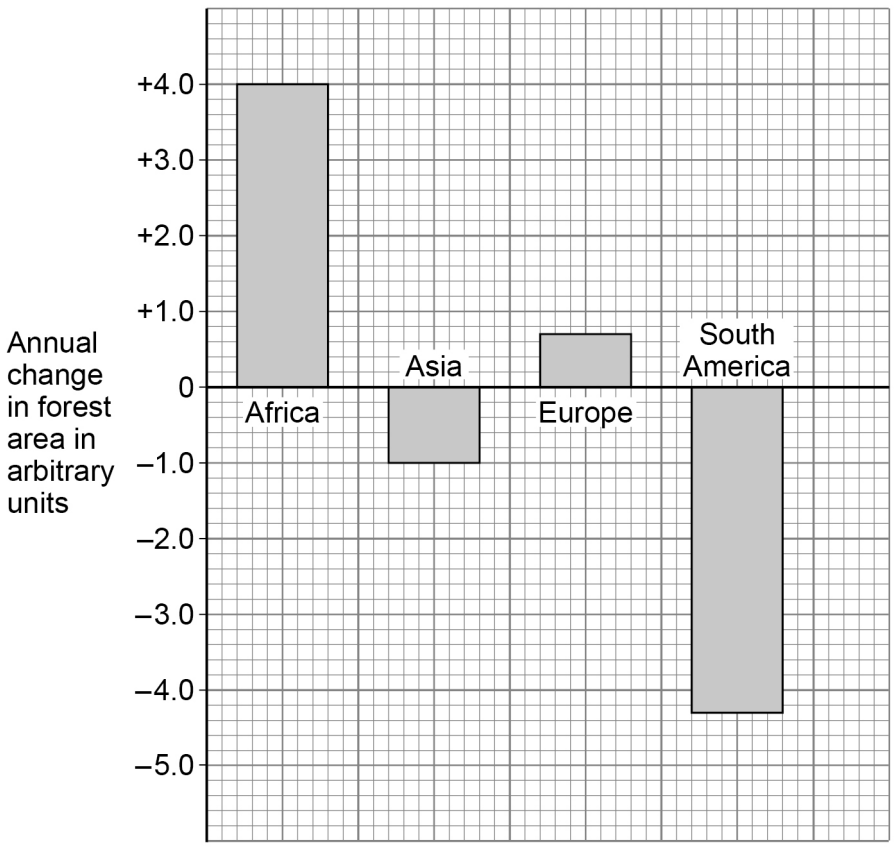
Question 2 continues on the next page

5.10.2.2 Ways of reducing the use of resources

Question 02 · continued

0 2 . 7 **Figure 2** shows the annual change in forest area in four different parts of the world.

Figure 2



Give **two** conclusions about the annual change in forest area.

[2 marks]

1 _____

_____

2 _____

_____

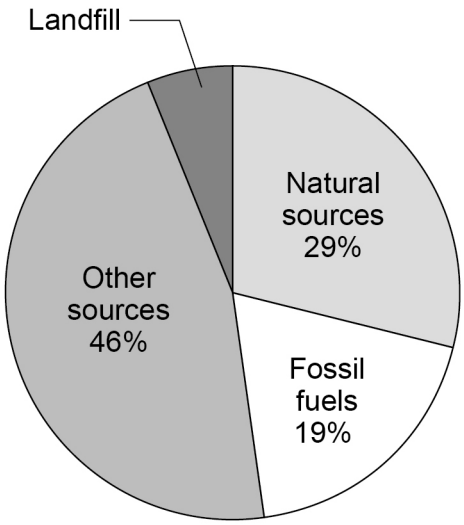
5.10.2.2 Ways of reducing the use of resources

Question 02 · continued

0 2 . 8 Methane is a greenhouse gas.

Figure 3 shows sources of methane emissions.

Figure 3



Determine the percentage (%) of methane emissions from landfill.

[1 mark]

Percentage = _____ %

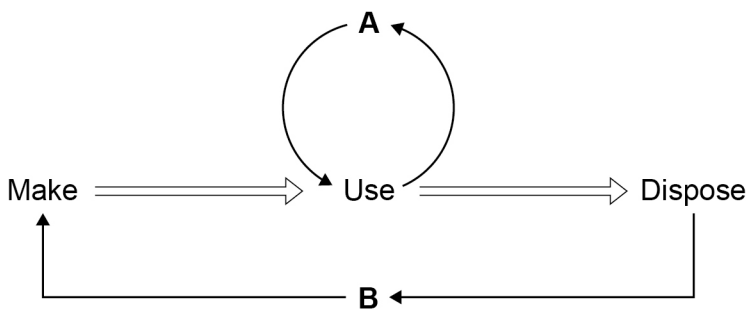
Question 2 continues on the next page

5.10.2.2 Ways of reducing the use of resources

Question 02 · continued

0 2 . 9 **Figure 4** shows two ways (**A** and **B**) of preventing used items going to landfill.

Figure 4



Name **A** and **B**.

Choose answers from the box.

[2 marks]

recycle	**reduce**	**release**	**reuse**	**reverse**

A _____

B _____

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5.10.2.2 Ways of reducing the use of resources

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

5.10.2.2 Ways of reducing the use of resources

Question 03 · continued

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

5.10.2.2 Ways of reducing the use of resources

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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5.10.2.2 Ways of reducing the use of resources

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 ☐

5.10.2.2 Ways of reducing the use of resources

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 = _____

5.10.2.2 Ways of reducing the use of resources

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

5.10.2.2 Ways of reducing the use of resources

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 _____.

5.10.2.2 Ways of reducing the use of resources

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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