

GCSE Combined Science: Trilogy

Worksheet: Using the Earth's resources and sustainable development

TIME 20 min	TOTAL 17 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Using the Earth's resources and sustainable development

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

0 1 . 1

Which of these best describes a renewable resource?

Tick (✓) **one** box.

It never runs out, however fast it is used

☐

It can be replaced as fast as it is used

☐

It comes only from crude oil

☐

It is always a metal

☐

[1 mark]

0 1 . 2

Give **one** reason why using finite resources sustainably is important.

.....

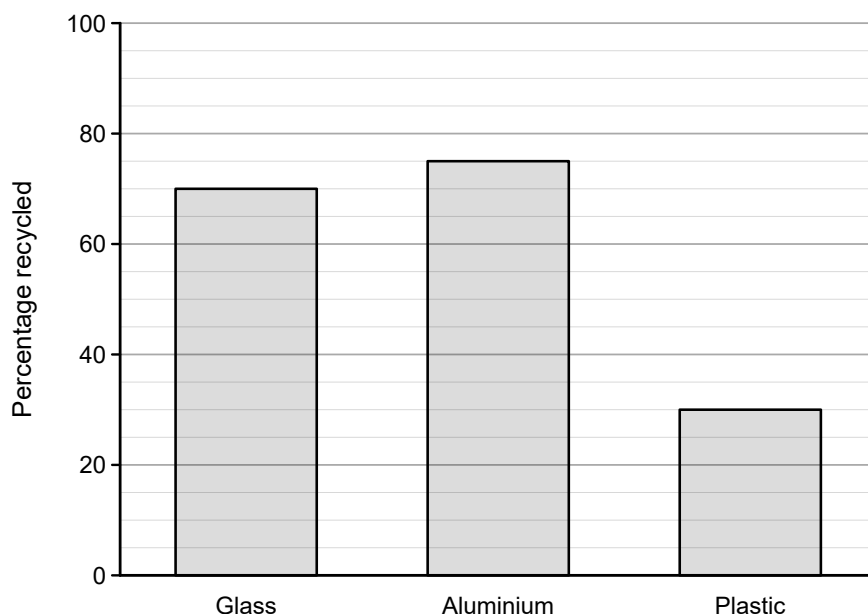
.....

[1 mark]

0 2

Figure 1 shows the percentage of three materials that is recycled in a country.

Figure 1



0 2 . 1

Use Figure 1 to calculate how many percentage points higher the aluminium recycling rate is than the plastic recycling rate.

.....

.....

.....

Difference = percentage points

[1 mark]

0 2 . 2

Suggest one reason why the plastic recycling rate might be lower than the aluminium recycling rate.

.....

.....

[1 mark]

0 3

0 3 . 1

What is meant by sustainable development?

[1 mark]

0 3 . 2

Which **two** are finite resources?

Tick (✓) **two** boxes.

Crude oil

☐

Timber from managed forests

☐

Metal ores

☐

Wool

☐

Cotton

☐

[2 marks]

0 3 . 3

Give **one** example of a natural product that has been supplemented or replaced by a synthetic product.

[1 mark]

0 4

0 4 . 1

Explain why 'reducing' the amount of a resource used is generally considered better for sustainability than 'recycling' it after use.

[2 marks]

0 5

Table 1 gives information about some resources.

Table 1

Resource	Source	Approximate time for the resource to be replaced
Coal	underground deposits	millions of years
Timber	managed forests	20 to 60 years
Copper ore	mines	millions of years
Cotton	cotton plants	1 year
Natural gas	underground deposits	millions of years

0 5 . 1

Name **two** finite resources in Table 1. Give a reason for your answer.

.....

.....

.....

.....

[2 marks]

0 5 . 2

Explain why timber from managed forests is a renewable resource.

.....

.....

[1 mark]

0 5 . 3

Explain how chemistry can help sustainable development.

.....

.....

.....

.....

[2 marks]

0 6

A 'circular economy' aims to keep materials in use for as long as possible, through reuse and recycling, rather than the traditional 'take, make, dispose' approach.

0 6 . 1

Explain how a circular economy approach could help reduce the depletion of finite resources.

.....

.....

.....

.....

[2 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Using the Earth's resources and sustainable development · 17 marks

Question 1 (2 marks)

01.1 [1 mark]

Correct: It can be replaced as fast as it is used

01.2 [1 mark]

- so that resources remain available for future generations, since they cannot be replaced once used up (1)
-

Question 2 (2 marks)

02.1 [1 mark]

Answer: 45

- $75 - 30 = 45$ (1)
-

02.2 [1 mark]

- different types of plastic are harder to separate, identify and recycle than aluminium, which can simply be melted down (allow other valid reasons, e.g. lower value of recycled plastic) (1)
-

Question 3 (4 marks)

03.1 [1 mark]

- development that meets the needs of current generations without compromising the ability of future generations to meet their own needs (1)
-

03.2 [2 marks]

Correct: Crude oil; Metal ores

03.3 [1 mark]

- wool / cotton / silk replaced by synthetic fibres (e.g. polyester, nylon) / natural rubber replaced by synthetic rubber / wood replaced by plastics / manure supplemented by synthetic fertilisers (1)
-

Question 4 (2 marks)

04.1 [2 marks]

- reducing use means less raw material needs to be extracted, and less energy is used in the first place (1)
 - recycling still uses some energy and resources to collect and reprocess the material, even though usually less than making it from raw materials (1)
-

Question 5 (5 marks)

05.1 [2 marks]

- any two from: coal / copper ore / natural gas (1)
 - they take millions of years to form, so they cannot be replaced as fast as they are used / they will run out (1)
-

05.2 [1 mark]

- new trees are planted and can grow to replace those cut down within a human lifetime / as fast as they are used (1)
-

05.3 [2 marks]

- chemists develop new or improved processes / products (e.g. using catalysts, recycling, renewable raw materials) (1)
 - that use less energy / fewer finite resources / produce less waste (1)
-

Question 6 (2 marks)

06.1 [2 marks]

- materials are reused or recycled repeatedly instead of being discarded after a single use (1)
 - this reduces the amount of new (finite) raw material that needs to be extracted to make new products (1)
-