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**GCSE Combined Science**

**Student Answer Booklet**

**Using Resources**

**Contents:**

1. ANSWERS Multiple Choice Quiz
2. ANSWERS Exam Practice

**Level 1 ANSWERS**

**GCSE Chemistry – Chemical and allied industries**

1. **d**
2. **a**
3. **a**
4. **d**
5. **b**
6. **c**
7. **a**
8. **a**
9. **b**
10. **c**
11. **c**
12. **a**
13. **d**
14. **a**
15. **a**
16. **c**
17. **d**
18. **a**
19. **c**
20. **a**

**Using resources Exam Practice Answers**

**Sustainability and Phytomining Question:**

**Level 3 (5–6 marks):**

A detailed, coherent and logical justification of the scientist’s statement, with relevant links made between statements in the question, phytomining and the effects of other methods of metal production on the environment.

**Level 2 (3–4 marks):**

An attempt to justify the scientist’s statement is made, with some attempt at linking statements. The logic may be inconsistent at times but builds towards a coherent argument.

**Level 1 (1–2 marks):**

Discrete relevant points made. The logic may be unclear and may not be consistent with the reasoning. Links are not made.

**0 marks:**

No relevant content

**Indicative content**

•        phytomining conserves supplies of ores

•        copper will be available for longer as at present rate of use copper ores will run out in about 35 years

•        phytomining conserves supplies of fossil fuels or energy

•        less fuel used at a lower cost

•        mining scars landscape or produces noise pollution

•        mining destroys wildlife habitats

•        with more phytomining less need to mine ores

•        with phytomining less habitat destroyed or less scarring of landscape

•        with phytomining less need to use landfill for waste

•        burning fossil fuels produces carbon dioxide / greenhouse gas

•        burning fossil fuels causes global warming or climate change

•        extraction from ores produces sulfur dioxide which causes acid rain

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**LCA Question:**

**Level 3 (5–6 marks):**

A logically structured evaluation with links involving several comparisons. Nearly all points made are relevant and correct.

**Level 2 (3–4 marks):**

Some valid comparisons made between the two types of bag. There may be some  
incorrect or irrelevant points.

**Level 1 (1–2 marks):**

A vague response with few correct and relevant points and with no direct comparisons.

**0 marks:**

No relevant content

**Indicative content**

Accept converse in terms of plastic bags for all statements

•        Paper bags are made from a renewable resource

•        Plastic bags are made from a finite resource

•        Paper bags require more energy to manufacture

•        Paper bags produce more waste

•        Paper bags are biodegradable

•        Paper bags create more CO2

•        CO2 created by paper bags offset by photosynthesis in growing wood

•        Paper bag requires much more fresh water

•        Paper bags cannot be recycled

•        Agree because non-renewability less important than other factors **or** disagree because of converse **or** can’t say because data inconclusive / incomplete

6

**Alloy Question:**

1. any **two** from:

•        brass / it is a mixture

accept brass / it is not pure

•        zinc changes structure / disrupts patterns or layers

•        copper metal atoms / layers able to slide over each other

accept zinc prevents atoms / layers sliding over each other

2

2. (a) mixture

**no**t compound

1

of a metal with other element(s) / metals

**not** of elements  
**not** of a metal with other substances

1

(b)     steel

allow stainless steel

1

(c)     stronger / increased strength / harder / less malleable / less brittle

**not** corrosion / rusting

1

(d)     copper and zinc

1

**Rusting Question:**

(a)     (i)      brown

1

(ii)     oxygen + iron + water   https://app.doublestruck.eu/content/AG_CHM/HTML/M/M14SIP204_files/img01.png   hydrated iron oxide / rust

allow correct symbol equation

ignore oxidation numbers for product

1

**Haber Process Question:**

(a)     2NH3

allow NH3 with incorrect or missing balancing for **1** mark

allow multiples

2

(b)     (i)      200

1

(ii)     rate of reaction (too) slow

allow converse

ignore references to yield / cost

1

(iii)    400

1

(iv)    lower yield

allow converse

accept shifts equilibrium to left

allow favours the backward reaction

allow favours side with more (gaseous) molecules

allow lower rate

1

(c)     (gases) cooled

it = ammonia

1

*ammonia* liquefied

accept ammonia condensed

accept ammonia cooled below boiling point for **2** marks

1

[8]