

# ResultsPlus

Examiners' Report  
November 2011

GCSE Chemistry/Science 5CH1F/01

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## Introduction

This is the first examination in the GCSE Science 2011 course and it has a very different style to the Edexcel 360 Science papers. This Unit is externally assessed, through a one hour, 60 mark written paper containing six questions. The foundation tier paper assesses grades G to C. The candidates were challenged by this longer paper and the mixture of question styles, including objective questions, short answer questions and extended writing questions.

The overall impression of the examiners was that many candidates coped well with this first examination. There were some examples of excellent answers.

Successful candidates:

- read the questions carefully and answered the questions as they were set
- used scientific words correctly
- understood and could describe the cracking experiment and how to find the volume of oxygen in a sample of air accurately
- selected correct information from a table of data.

Some answers were of a lower standard. Less successful candidates:

- did not read the questions carefully and gave answers that were related to the topic being tested, but did not answer the question
- did not understand the meaning of key scientific words and phrases
- could not use the information given in the questions, particularly when describing experiments

In future, candidates need more practice in answering these new styles of questions, particularly the six-mark questions. These can be done as homework or in lessons throughout the course. Candidates also need as much practice as possible in describing experiments and explaining what is happening in them.

## Question 1 (a) (i)

The majority of candidates were able to give a correct response to this question.

- 1 (a) Hydrochloric acid is produced in the stomach.  
When too much acid is produced it can cause indigestion.

(i) Give a reason why hydrochloric acid is present in the stomach.

(1)

To help breakdown food.



**ResultsPlus**

**Examiner Comments**

Some candidates gave a response similar to the one in the clip, while others mentioned that the acid kills bacteria on the food or helps with digestion. A number of candidates misread the question and gave a reason as to how the acid is in the stomach. Common incorrect answers included that the acid is produced when you eat too much or by too many fizzy drinks.



**ResultsPlus**

**Examiner Tip**

Candidates should read the question carefully.

## Question 1 (b) (i)

This question was mostly answered well.

(i) Explain how indigestion tablets relieve this pain.

(2)

Indigestion tablets relieve this pain by neutralizing excess hydrochloric acid produced by the stomach. The hydrochloric acid is turned into water.



**ResultsPlus**

**Examiner Comments**

The majority of candidates realised that the pain is caused by excess acid. The candidate in this clip also realised that the indigestion tablets neutralise the acid.

Common misunderstandings included the idea that the tablets contained acid and that the tablets act directly on the pain as if they are analgesics.

(i) Explain how indigestion tablets relieve this pain.

(2)

Indigestion tablets relieve the pain by diluting the acid in the stomach.



**ResultsPlus**

**Examiner Comments**

This candidate understands that the pain is caused by acid but they did not receive any credit for the use of the word 'diluting'. They should have mentioned some reaction between the tablets and the acid.



**ResultsPlus**

**Examiner Tip**

Try to use correct scientific words. In this question, suitable phrases would include: neutralise the acid, react with the acid or break down the acid.

## Question 1 (c)

This question was found challenging by many candidates. The majority of candidates did not read the whole question carefully. They just saw the words 'acid rain' and wrote about how to reduce this.

- (c) Waste gases from coal-fired power stations can be acidic.  
These waste gases can be passed through calcium carbonate.

Explain how the calcium carbonate helps to reduce the amount of acid rain.

(2)

because the calcium carbinate  
takes away the acidity from the  
acid rain to neutralise it.



### ResultsPlus Examiner Comments

This clip shows a common wrong answer. The candidate seems to think that the calcium carbonate must be put into the clouds to remove the acidity from the acid rain. They have ignored the first two sentences that state clearly that the waste gases from the power station are acidic.



### ResultsPlus Examiner Tip

Read all of the information given in the question, not just the sentence above the space where you are writing your answer.

- (c) Waste gases from coal-fired power stations can be acidic.  
These waste gases can be passed through calcium carbonate.

Explain how the calcium carbonate helps to reduce the amount of acid rain.

(2)

Calcium carbonate is an alkali and  
it will neutralise the  $\text{SO}_2$  when  
it passes through calcium carbonate.



### ResultsPlus Examiner Comments

This candidate knows that the waste gases contain sulphur dioxide and that the calcium carbonate neutralises the gas.

### **Question 2 (a)**

This question was answered quite well. Candidates should learn the spelling of scientific words.

Quite a lot of candidates confused cracking and fractional distillation. They should try to learn that fractional distillation is a separation process, whereas cracking is a chemical reaction.

### **Question 2(b)**

The vast majority of candidates were able to select the correct oil well from the table of data.

### **Question 2(c)**

The majority of candidates were able to select fuel oil as the fraction present in almost the same percentage in the crude oils from the three oil wells.

## Question 2 (e)

A large number of candidates scored one mark for this question.

(e) Petrol fractions contain the hydrocarbon octane,  $C_8H_{18}$ .

Explain what is meant by the term **hydrocarbon**.

(2)

hydrocarbons ~~is~~ contains <sup>only</sup> hydrogen and carbon  
that's why it is called hydrocarbons.



**ResultsPlus**  
Examiner Comments

This clip shows a typical response worth two marks as the candidate has realised that the word 'only' is important.



**ResultsPlus**  
Examiner Tip

Understand why it is important to include the word 'only'. Ethanol has the formula  $C_2H_6O$ . It contains carbon and hydrogen, but it is not a hydrocarbon as it also contains oxygen.

(e) Petrol fractions contain the hydrocarbon octane,  $C_8H_{18}$ .

Explain what is meant by the term **hydrocarbon**.

(2)

hydrocarbon is a compound  
made up of hydrogen and carbon



**ResultsPlus**  
Examiner Comments

This shows the most common answer worth one mark. Common incorrect answers included: compounds containing hydro and carbon or compounds containing hydrogen and carbon dioxide. There were some answers poorly expressed in terms of mixtures or hydrogen and carbon molecules. On this occasion the examiners ignored these poor expressions, but candidates should be encouraged to use the correct chemical terms.

## Question 2 (f)

Many of the candidates were familiar with the limewater test for carbon dioxide. Some candidates stated that carbon dioxide puts out a lighted splint. although this is true, it is not a test to identify carbon dioxide as other gases, such as nitrogen, also put out a lighted splint.

(f) One product obtained when hydrocarbons burn in air is carbon dioxide.

Describe a test to show that a gas is carbon dioxide.

(2)

you need a test tube to catch the  
Carbon Dioxide then you need to test  
it with Limewater.



**ResultsPlus**

**Examiner Comments**

This clip shows a response where the candidate has identified the correct test reagent for carbon dioxide but they have not given the result of the test.



**ResultsPlus**

**Examiner Tip**

When you are describing a test to identify a gas you must include the test reagent, limewater in this question, and the correct observation.

(f) One product obtained when hydrocarbons burn in air is carbon dioxide.

Describe a test to show that a gas is carbon dioxide.

(2)

to test for carbon dioxide you  
bubble the carbon dioxide through  
limewater. If the the limewater  
goes milky then you have Carbon dioxide



**ResultsPlus**

**Examiner Comments**

This is an excellent answer as the candidate has described clearly how to carry out the test and the observation that would be made.

### Question 3 (a)

A minority of candidates could explain what is meant by the term unsaturated, when it is applied to hydrocarbons, but the majority could not and they wrote general ideas, such as 'not filled up'.

3 (a) Ethene is an unsaturated hydrocarbon.

State what is meant by the term **unsaturated**.

(1)

unsaturated means there is a double or triple bond.



**ResultsPlus**

**Examiner Comments**

This clip shows an excellent response in which the candidate clearly understands the meaning of unsaturated. It was not essential to mention both double and triple bond.

3 (a) Ethene is an unsaturated hydrocarbon.

State what is meant by the term **unsaturated**.

(1)

~~It has no spare bonds.~~



**ResultsPlus**

**Examiner Comments**

This clip shows a fairly common incorrect response, in which the candidate has an idea about unsaturation, but it is not precise enough to achieve a mark.



**ResultsPlus**

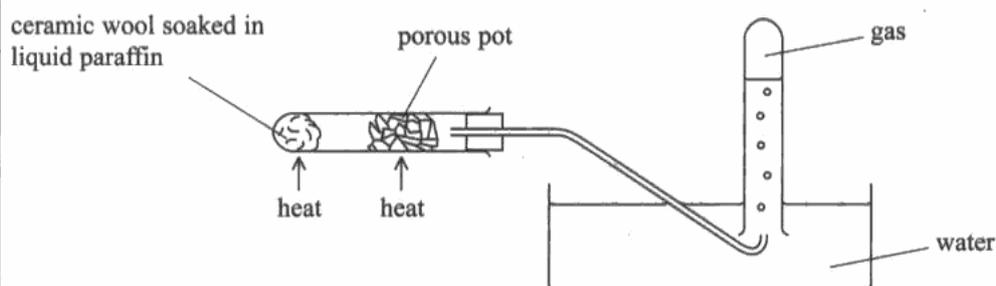
**Examiner Tip**

Learn the scientific meaning of the key words in each topic.

### Question 3 (c)

This question was generally not well answered. It was disappointing that many candidates seemed unfamiliar with this experiment. This style of question is easier for the candidates to answer if they have carried out the experiment or seen it demonstrated. Many candidates did not understand the diagram and started with the gas produced on the right and moved backwards to the heat. Some thought the water was to cool the gas. A significant number thought that when the liquid paraffin is heated, it suddenly turns into ethene and they did not understand the purpose of the hot porous pot. Very few candidates really grasped the concept that cracking was taking place and that the large molecules were being broken down.

(c) A gas containing ethene can be produced from liquid paraffin using this apparatus.



Describe how liquid paraffin becomes ethene in this experiment.

(3)

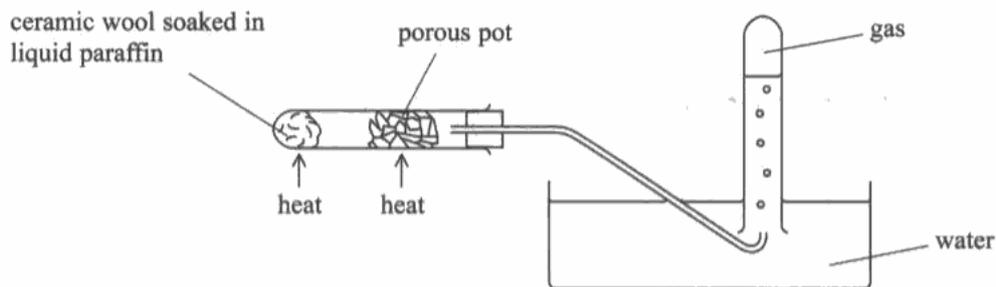
The paraffin is heated next to a catalyst to speed up the reaction and as the liquid paraffin evaporates it separates into smaller hydrocarbons like ethene. This process is called cracking.



**ResultsPlus**  
Examiner Comments

This clip shows one of the better answers seen to this question. The answer is not perfect and does not include all of the possible details, but there is enough here for the candidate to score three marks. The marks were awarded for heating the paraffin, the liquid paraffin evaporates and cracking.

(c) A gas containing ethene can be produced from liquid paraffin using this apparatus.



Describe how liquid paraffin becomes ethene in this experiment.

(3)

The liquid paraffin is soaked in wool and gets heated up, it then passes through the porous pot continuously being heated up, it then slides down the tube and into the water, it then gives off bubbles caught in a test tube and those bubbles are ethene gas.



### ResultsPlus

Examiner Comments

This clip shows a response that starts correctly with the liquid paraffin being heated and the porous pot being continuously heated. However, there is no mention of how the paraffin molecules are converted into ethene, so this response scored two marks.



### ResultsPlus

Examiner Tip

Carry out the experiments from the specification or watch them being demonstrated. If this is not possible, there are many video clips or animations of them available for you to look at.

### Question 3 (d)

Many candidates confused cracking with polymerisation, however, a significant number did understand how ethene molecules form poly(ethene) molecules. A few candidates showed the polymerisation reaction using an equation and scored full marks.

(d) Ethene is used to make poly(ethene).

Describe how ethene molecules form poly(ethene) molecules.

(2)

Ethene molecules join together to create bonds, and this is then called poly(ethene).



#### ResultsPlus Examiner Comments

This clip shows a response that is worth one mark as the candidate has stated that ethene molecules join together. They could have scored another mark by adding the word 'many' before 'ethene molecules'.

(d) Ethene is used to make poly(ethene).

Describe how ethene molecules form poly(ethene) molecules.

(2)

many ethene molecules are polymerized, to form the polymer



#### ResultsPlus Examiner Comments

This candidate has mentioned 'many ethene molecules' and 'form the polymer' so scores two marks. 'Polymerised' is an alternative answer to 'form the polymer'.



#### ResultsPlus Examiner Tip

Try to understand how different polymers are formed from monomers.

### Question 3 (e)

This question was on a topic that is familiar to the vast majority of students. A large number of students scored marks by writing reasonably coherently about one or two ideas on non-biodegradability, landfill sites and dangers to wildlife. A significant number of candidates think that poly(ethene) is toxic or that it release toxic gases when it is just left in a landfill site. They may be confused with landfill sites producing methane for other reasons and it should be made clear to candidates that polymers may only produce toxic gases when they are **burnt**.

(e) Waste poly(ethene) can cause problems.

Explain the problems caused by waste poly(ethene).

(2)

Waste poly(Ethene) causes damage to the environment by releasing gases such as CO<sub>2</sub> into the air which cause damage to the environment by making greenhouse gases.

(Total for Question 3 = 10 marks)



#### ResultsPlus Examiner Comments

This clip shows a common response in which the candidate has identified carbon dioxide and the damage that it does to the environment, but they have not mentioned that the poly(ethene) needs to be **burnt** to produce this gas.



#### ResultsPlus Examiner Tip

Think carefully about what you write. Do polythene bags really release carbon dioxide into the air when they are just left on their own?

(e) Waste poly(ethene) can cause problems.

Explain the problems caused by waste poly(ethene).

because it isn't biodegradable which means (2)  
it won't rot and it won't break down for  
thousands of years.



**ResultsPlus**  
Examiner Comments

This is a good response in which the candidate has stated that the poly(ethene) is not biodegradable and explained what this means, so they scored two marks.

### Question 4 (a) (i)

This question was answered well by the majority of candidates.

### Question 4 (b) (ii)

This question was usually answered very well. The vast majority of students were able to describe photosynthesis and the change in the amounts of carbon dioxide and oxygen in the atmosphere. Some candidates confused photosynthesis with respiration and a few stated that the amounts of gases changed but did not state whether they increased or decreased.

(ii) Explain how the growth of primitive plants changed the percentage of oxygen and carbon dioxide in the Earth's early atmosphere.

(2)

It changed by photosynthesis. plants took carbon dioxide in and gave out oxygen.



**ResultsPlus**  
Examiner Comments

This is a very good answer, showing all of the points from the mark scheme.

(ii) Explain how the growth of primitive plants changed the percentage of oxygen and carbon dioxide in the Earth's early atmosphere.

(2)

As time went on more trees grew so it gave ~~the~~ the world more oxygen



**ResultsPlus**  
Examiner Comments

This answer scored one mark as it stated that more oxygen would be produced but there was no mention about the amount of carbon dioxide.



**ResultsPlus**  
Examiner Tip

When a question asks you to comment on two points, you need to include both of them in your answer to achieve full marks for that question.

## Question 4 (c)

This was the first of the six-mark extended writing questions. The candidates were given a lot of information about the experiment in the question. Unfortunately, a number of candidates seemed unfamiliar with this experiment and their answers appeared to show that they had not seen the experiment demonstrated or seen an animation or video clip of it. The majority of candidates scored their marks for realising that the copper reacts with oxygen from the air to form copper oxide. A few candidates wrote excellent explanations of how to show there is  $21 \text{ cm}^3$  of oxygen in  $100 \text{ cm}^3$  of air. Common misunderstandings included: the copper burns, the oxygen is in one syringe and air in the other, the copper blocks the air, so when syringe A is pushed the copper goes into syringe B, copper releases oxygen and this collects in the syringe and the volume of air left at the end is  $21 \text{ cm}^3$ .

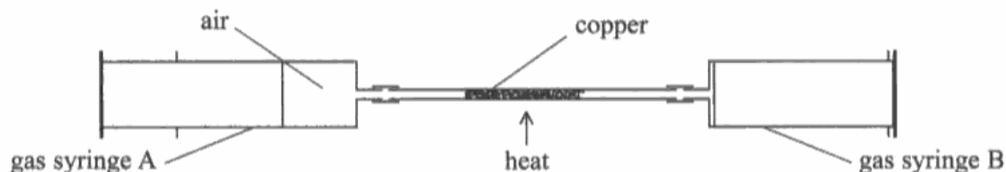
\* (c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment,  $100 \text{ cm}^3$  of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the  $100 \text{ cm}^3$  of air contained  $21 \text{ cm}^3$  of oxygen.

The air will be passed through the heat from syringe A and copper (6)  
into syringe B but not all the air will be passed through  
therefore each time its being passed the oxygen is decreasing  
as it is being lost due to the copper and heat from  
copper oxide.



**ResultsPlus**  
Examiner Comments

This is an example of a level 2 answer. The candidate has realised that the air is passed over the hot copper and the amount of oxygen is decreasing. They have also mentioned the formation of copper oxide. A little more detail would be needed to progress to level 3, for example, stating that the volume decreases until there is no further change or decreases by  $21 \text{ cm}^3$ .

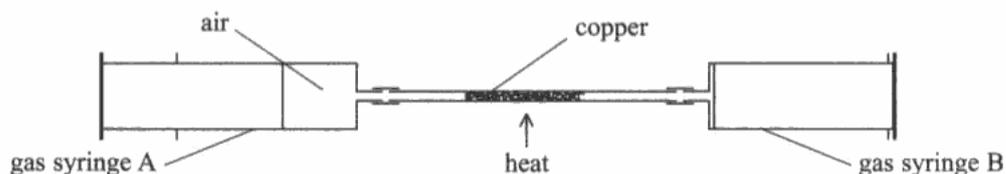
\* (c) Experiments can be carried out to find the volume of oxygen in a given volume of air.

When hot, copper reacts with oxygen.

In one experiment the following apparatus is used.

At the start of the experiment, 100 cm<sup>3</sup> of air is in gas syringe A.

The air is passed backwards and forwards over the heated copper.



Describe how the apparatus can be used to show that the 100 cm<sup>3</sup> of air contained 21 cm<sup>3</sup> of oxygen.

(6)

When the copper reacts with the oxygen, the oxygen is combining with the copper. Copper oxide is a solid so the volume of the gas going back and forth decreases as the oxygen is reacting with the copper. When the volume of the air stops decreasing, the new measured volume of the air would be 79 cm<sup>3</sup>. It should be 79 cm<sup>3</sup> because the amount of oxygen that has reacted should be 21 cm<sup>3</sup>.  $100 - 79 = 21$ .



**ResultsPlus**

**Examiner Comments**

This is an excellent answer in which the candidate has understood what happens in this experiment and has written a clear and logical description using correct scientific terminology. This scored six marks.



**ResultsPlus**

**Examiner Tip**

Revise the experiments you have done or demonstrations that you have seen so that you can describe them and explain what happened.

### Question 5 (a) (ii)

There were a lot of good answers to this question. The majority of candidates were able to identify dead animals and many realised the long time scale to form fossils. There were many candidates who tried to answer this question by describing how a sedimentary rock is formed but with no reference to plants or animals. Some described the fossil sinking into the sediment but did not state where the fossil came from.

(ii) Limestone is a sedimentary rock.

Explain how fossils are formed in limestone.

(3)

To form a fossil a species of animal must lay upon a rock and stay there for millions of years as mud and other things press down onto it, it forms an imprint on the rock of the dead species.



**ResultsPlus**  
Examiner Comments

This candidate has given a good answer. Although they haven't mentioned that the animal is dead, this can be assumed by the time scale they have written.

(ii) Limestone is a sedimentary rock.

Explain how fossils are formed in limestone.

(3)

fossils are formed in limestone from many years of layers compacted on top of each other, <sup>which creates</sup> ~~creates~~ a great amount of pressure. Therefore everything ~~will be~~ that is inbetween will be contained between the layers.



**ResultsPlus**  
Examiner Comments

This is an example of an answer in which the candidate has described how sedimentary rock is formed but has omitted the dead plant or animal that forms the fossil.



**ResultsPlus**  
Examiner Tip

Read through your work to make sure that you have actually answered the question that you were asked.

## Question 5b

A large number of candidates knew that both heat and pressure are needed to form marble from limestone. There were a few candidates who confused this process with the formation of igneous rocks and there were references to the rock melting and cooling or molten magma.

(b) Marble is also a form of calcium carbonate.  
It is a metamorphic rock.

Explain how marble is formed from limestone.

(2)

marble is formed from limestone and chalk. At high temperature the limestone is broken down and it reforms as small crystals. This gives marble a more even texture and makes it very hard.



**ResultsPlus**  
Examiner Comments

This answer refers to heat and not pressure so scored one mark.

(b) Marble is also a form of calcium carbonate.  
It is a metamorphic rock.

Explain how marble is formed from limestone.

(2)

marble is a metamorphic rock. They are formed from sedimentary rocks. So the pressure of the sedimentary rocks from above and the heat below from magma is causing marble to form in between.



**ResultsPlus**  
Examiner Comments

This is a very good answer, scoring both marks.



**ResultsPlus**  
Examiner Tip

Revise the formation of the different types of rocks.

### Question 5 (c) (ii)

This question was answered correctly by a lot of candidates. All of the relevant substances were in the rubric of the question so it was disappointing that some candidates did not score a mark. The common errors were the addition of other substances, such as oxygen or water, and trying to write a balanced equation. The foundation tier paper will only test word equations, as stated in the specification. However, candidates will be given credit if they write a **correct** balanced equation.

(ii) Write the word equation for this reaction.

calcium carbonate + oxygen → calcium oxide + carbon dioxide (1)



**ResultsPlus**  
Examiner Comments

This candidate has confused thermal decomposition with oxidation.



**ResultsPlus**  
Examiner Tip

Read all of the information in the question and use it in your answer. There was no mention of oxygen in this question.

(ii) Write the word equation for this reaction.

Calcium carbonate → Calcium oxide + Carbon dioxide (1)



**ResultsPlus**  
Examiner Comments

This is a correct answer.

## Question 5 (d)

Some candidates scored one mark for this question but it was disappointing that two marks answers were very rare. There were many references to colour changes, although not stating what colours were involved, and a surprising number mentioning that it gets cold or freezes. Some candidates did not read the question carefully and they stated that calcium hydroxide would be formed but they did not state what they would **see**.

(d) Describe what you would **see** when water is added drop by drop to a sample of cold calcium oxide. Carbon dioxide  
(2)

It would start to heat up and then bubble.



### ResultsPlus Examiner Comments

This is an example of a common response. The candidate scored one mark for 'bubble' but did not score a mark for 'heat up' as that is not something they could see.

(d) Describe what you would **see** when water is added drop by drop to a sample of cold calcium oxide. (2)

Calcium oxide would react with the water and form calcium hydroxide.



### ResultsPlus Examiner Comments

This candidate knows the chemical reaction taking place, but unfortunately does not score a mark as they have not answered the question and described what they would see.



### ResultsPlus Examiner Tip

When a question asks you to describe what you would **see** during a reaction, you must write down the observations you would make.

## Question 6 (a)

The vast majority of candidates scored one mark for this question.

## Question 6 (b)

Many of the candidates could answer this question correctly, however, some just repeated the question and stated malachite instead of the more general term 'ores'.

## Question 6 (c) (i)

This question was testing the ability of candidates to select correct information from a table of data. A large number of candidates listed all the properties of steel without thinking about the reasons behind why those properties make steel useful for pylons. Candidates who included poor resistance to corrosion or good conductor of electricity were given a maximum of one mark as they clearly did not understand the purpose of the pylons. Many candidates did not seem to know the difference between pylons and overhead power cables. Some candidates mis-read the question and tried to suggest that copper or aluminium would be the best metal to use.

(i) The pylons are made of steel.

Use information from the table to explain which properties of steel make it the most suitable of these three metals for the pylons.

Because it <sup>is the</sup> ~~is~~ cheapest out of all three, it's a <sup>(2)</sup> good ~~electrical~~ electricity conductor and it is the strongest.



**ResultsPlus**  
Examiner Comments

This answer was given one mark. Although the candidate has included the two correct answers related to cost and strength, they have also added that it is a good electricity conductor and this is incorrect - the pylons support the overhead power cables and do not carry the current.



**ResultsPlus**  
Examiner Tip

Just select the important information from a table of data. Do not include any additional information that is an incorrect answer to the question.

(i) The pylons are made of steel.

Use information from the table to explain which properties of steel make it the most suitable of these three metals for the pylons.

The relative strength is very high<sup>(2)</sup>  
and the cost per tonne is very  
cheap at £505.



**ResultsPlus**  
Examiner Comments

This is a very good answer. The candidate has just selected the two relevant properties and expressed them clearly.



**ResultsPlus**  
Examiner Tip

Give full answers to questions, as in this clip. Avoid answers that are too short, such as 'cost and strength' as this does not make it clear that steel is cheaper and stronger than the other metals.

## Question 6 (c) (ii)

Candidates also tended to list all of the properties of aluminium here, although there was no ceiling put on the maximum mark they could achieve this time as the additional properties were irrelevant but not incorrect. A number of candidates also mis-read the question and explained why copper is better than aluminium for the overhead power cables.

(ii) Use information from the table to explain which properties of aluminium make it more suitable than copper for making overhead power cables.

(2)

Aluminium is more suitable as it has less density meaning it wouldn't weigh as much as copper, it's also a lot cheaper.



**ResultsPlus**  
Examiner Comments

This is a good two mark answer as the candidate has just selected the two relevant properties of aluminium.

(ii) Use information from the table to explain which properties of aluminium make it more suitable than copper for making overhead power cables.

(2)

Aluminium is ~~is~~ much more cheaper which is more suitable because of the money problems at the moment



**ResultsPlus**  
Examiner Comments

This answer just refers to cost so scores one mark.



**ResultsPlus**  
Examiner Tip

Read the questions carefully and answer the question asked. If a question asks you why aluminium is more suitable than copper for a particular use, don't change the question around and explain why copper is more suitable than aluminium.

## Question 6 (d)

This was the second of the six-mark extended writing questions. There were very few blank spaces for this answer as almost all of the candidates could write something about recycling. Unfortunately, many of the answers were vague and repetitive. Phrases such as 'better for the environment' and 'cause pollution' should be avoided and candidates should be encouraged to write about specific environmental and chemical factors, not economic considerations. A significant number of candidates forgot that the question was about metals and wrote generally about recycling other materials so they included comments about biodegradability, releasing greenhouse gases and destroying the ozone layer. There were a few good answers in which the candidates wrote about one aspect of recycling metals in detail or wrote in less detail but included several different relevant points. However, these types of answers were few and far between. Candidates should be given as much practice as possible in answering this style of question.

\*(d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

Because metal can be melted down and used<sup>(6)</sup> again as either alloys or the same metal. It is cheaper just to recycle metal than mine more ore and extract it. It is also better for the environment because they don't need to make quarry's and don't take up land fill sites. Quarry's are ugly, and cause alot of noise and take up alot of land.



**ResultsPlus**  
Examiner Comments

This is an example of a level 3 answer. The candidate understands what happens when metals are recycled and has written in some detail about quarrying and extraction of metals.

\*(d) Iron for making steel, copper and aluminium is obtained from substances found in the Earth's crust.

The metals are made into many useful things.

When no longer required the metal articles are thrown away as waste or recycled.

Explain why it is important to recycle these metals rather than put them in general household waste.

(6)

It is better to recycle the metals because it is better for the environment, doesn't fill up the landfill sites, its cheaper if you recycle, more metal can be produced, you can use it ~~and~~ over and over again and not as much chemical from extracting metals go in the atmosphere. It cheaper so then ~~you~~ people dont have to produce more and more metal, it doesnt fill landfill sites because it doesnt go there and if you kepp recycling it, you can use it again (Total for Question 6 = 12 marks)



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**Examiner Comments**

This candidate clearly knows that by recycling metals we will not fill up landfill sites, although they did not need to repeat this point. This moves the answer into level 1. The phrase 'better for the environment' is vague and would have increased the level of the answer if the candidate had added 'there will be less damage to the environment from waste metals'. 'It's cheaper to recycle' was seen in many answers but was not given any credit unless it was explained clearly, as in some cases, recycling is more expensive than extracting new metal. The answer goes someway to explaining less damage to the atmosphere from extracting the metal, which raises this answer to level 2. However, the use of the term 'chemical' is rather vague, so this answer would score three marks rather than four.



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**Examiner Tip**

Try to save time by not repeating the same information in an answer. Try to include specific scientific words in your answers.

## Paper Summary

In order to improve their performance, candidates should:

- read all of the information in the question carefully and use it to help them to answer the question,
- learn the meanings of as many of the key scientific words in each topic as possible,
- write word equations to represent chemical reactions, unless they are confident that they know the correct formulae for the reactants and products,
- revise all the experiments they have carried out, or seen demonstrated, so that they can describe them and explain what is happening,
- learn the tests for the gases hydrogen, oxygen, carbon dioxide and chlorine carefully, including the correct observation,
- practise answering the six-mark questions so that they understand how to improve their answers and progress from one level to the next.

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