GCSE

Sciences

Guidance on Quality of Written Communication

Quality of Written Communication

Requirement to assess Quality of Written Communication

AQA is required by the regulating body Ofqual to assess Quality of Written Communication (QWC).

In GCSE specifications that require candidates to produce written material in English, candidates must do the following:

- ensure that text is legible and that spelling, punctuation and grammar are accurate so that the meaning is clear
- select and use a form and style of writing appropriate to the purpose and to complex subject matter
- organise information clearly and coherently, using specialist vocabulary when appropriate.

Where QWC will be assessed

In these specifications QWC is assessed in all units by means of longer response questions.

These questions are clearly indicated in each question paper by the instruction:

"In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate."

How QWC will be assessed

Each QWC answer will be marked out of a total of six (6) marks.

In questions where QWC is assessed, **the general criteria on the next page should be used to assign marks to a level.**

Level 1 marks

1-2

Level 1: basic (1–2 marks)

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2 marks

3-4

Level 2: clear (3–4 marks)

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3 marks

5-6

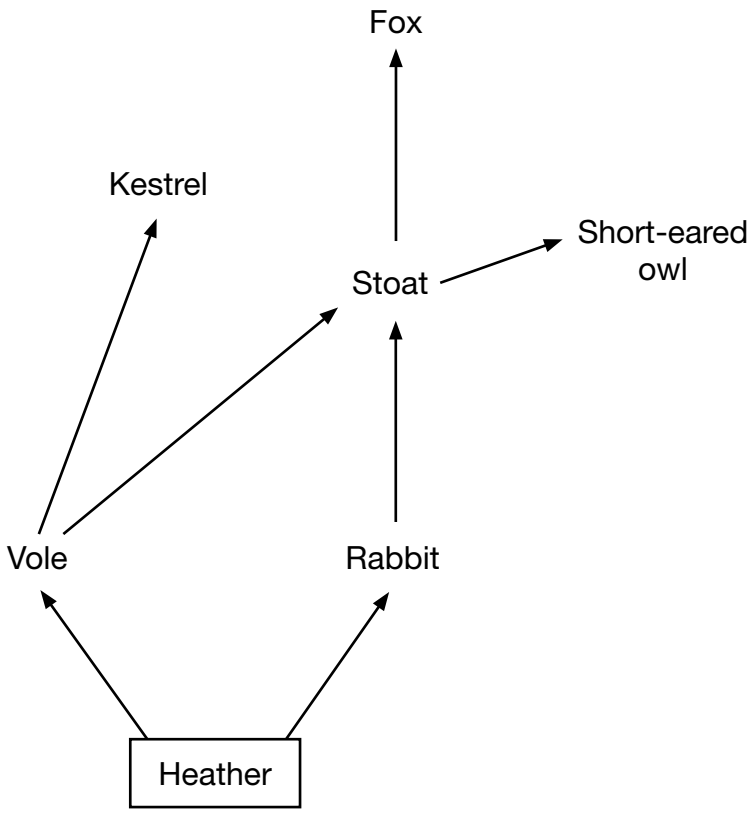
Level 3: detailed (5–6 marks)

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately
- The answer shows almost faultless spelling, punctuation and grammar.

An example from Biology Unit 1

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

The diagram below shows a food web for some of the organisms that live on moorland.



Only a small percentage of the Sun's energy captured by the heather is eventually incorporated into the body tissues of the fox.
Explain, as fully as you can, what happens to the rest of the energy captured by the heather.

Mark Scheme

Question 5

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 1.

0 marks	Level 1 1-2 marks	Level 2 3-4 marks	Level 3 5-6 marks
No relevant content.	There is a brief explanation of at least two ways in which the energy captured by the heather is transferred, which has little clarity and detail. Credit may be awarded either for references to general ways in which organisms transfer energy or to ways in which specific organisms in the food web transfer energy.	There is some explanation of a range of the ways in which the energy captured by the heather is transferred. Credit may be awarded either for references to general ways in which organisms transfer energy or to ways in which specific organisms in the food web transfer energy.	There is a clear, balanced and detailed explanation of a large variety of ways in which energy captured by the heather is transferred. Credit may be awarded either for references to general ways in which organisms transfer energy or to ways in which specific organisms in the food web transfer energy.

examples of biology points made in response

- respiration releases energy (allow this point even if given for named organism). NB: to gain full marks, candidates must gain this mark
- some energy lost in animals/named animal's waste materials
- some energy used in maintenance/repair (allow this point if given for named organism)
- some energy used for movement (allow this point if given for named animal)
- energy lost as heat to surroundings (allow this point if given for named organism)
- some organisms die (rather than being eaten) (allow this point if given for named organism)
- reference to detritivores/microbes/decomposers/microorganisms.

Example of a five mark answer

BIOLOGY

Level 3 marks
5 ✓

The heather is a producer. Light energy captured by the heather is converted into carbohydrates, which are then converted into a wide range of organic compounds. Some of the carbohydrates are used in respiration by the heather. Some of the energy is transferred to the environment.

Heather is eaten by herbivores such as rabbits. However, these herbivores do not eat all the heather. Some of it eventually dies and the organic compounds in the cells are broken down and absorbed by micro-organisms such as bacteria. The bacteria use some of the organic compounds in respiration, transferring energy to the environment.

The herbivores cannot digest all parts of the heather, so some of the organic compounds pass out of the herbivores' bodies in the faeces. Herbivores respire, and some of the energy is used for growth and some is used in locomotion. Much of the energy is transferred to the environment as heat. Thus only a small proportion of the energy that the herbivores obtain from the heather is transferred to the carnivores such as kestrels and foxes.

5/6

Marks awarded according to the following rationale

- It is clear from reading through this answer that the candidate has sound knowledge and understanding of the subject area.
- The information is presented coherently and logically.
- The spelling, punctuation and grammar are all very good; although there are a couple of small errors.
- The answer contains a wide range of specialist terms (such as producer, herbivore, carnivore, respiration, faeces, bacteria, organic, carbohydrate, environment, energy transfer), used correctly.
- The candidate has described a wide range of ways in which energy is 'lost'.
- The energy transfers are presented in the correct sequence, beginning with the heather and finishing with the kestrel and fox.
- This is clearly a Level 3 answer. However, the candidate has not mentioned the point given in the mark scheme as essential to ensure that full marks may be awarded ('respiration releases energy'), so only 5 marks are awarded.

Example of a four mark answer

Level 2 marks

4 ✓

The heather is eaten by vegetarians such as rabbits and voles. T the vegetarians are eaten by meat eaters such as stoats and these are then eaten by the fox.

All of the animals respire. R a Respirtion produces heat energy, which is lost to the surroundings.

All of the animals lose waste materials such as a ~~f~~eces. The energy in these is used by microbes.

Animals also lose energy when they move around.

4/6

Marks awarded according to the following rationale

- The candidate clearly has some knowledge of the subject, and has referred to several of the scientific points in the mark scheme.
- The answer has some structure to it – energy transfers are described in the correct sequence.
- There are a number of errors in spelling and punctuation – the first paragraph is not punctuated and the second paragraph has a sentence beginning with a lower case letter. Respiration and faeces are misspelt.
- Some technical terms are used (such as respiration, faeces, and microbes), but other terms used, such as vegetarian and meat eater do not qualify.
- All of this demonstrates that this is a Level 2 answer, and there is enough in it to award 4 marks.

Example of a one mark answer

BIOLOGY

Level 1 marks

1 ✓

All animals need engy to move. They also loose energy in their waste.
The foxs don't eat all the other animals in the food ~~web~~ chain.

1/6

Marks awarded according to the following rationale

- This answer is very weak, although there is some attempt, suggesting that Level 1 is appropriate for the marks.
- There is no structure to the answer.
- Spelling, punctuation and grammar are very poor.
- There is practically no use of specialist terms.
- This response is at the bottom of Level 1, and is worth no more than 1 mark.

Examination hints and tips
Candidates should:

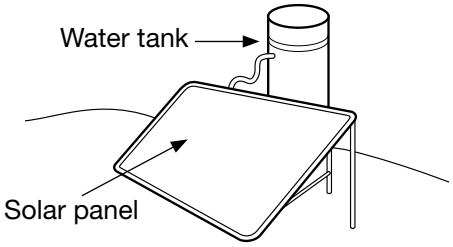
Use paragraphs and full sentences.

Decide on a sequence for their answer – in this case start with the heather, then move onto the herbivores and finally the carnivores.

Include as many relevant specialist terms as possible, such as herbivore, carnivore, respiration, faeces.

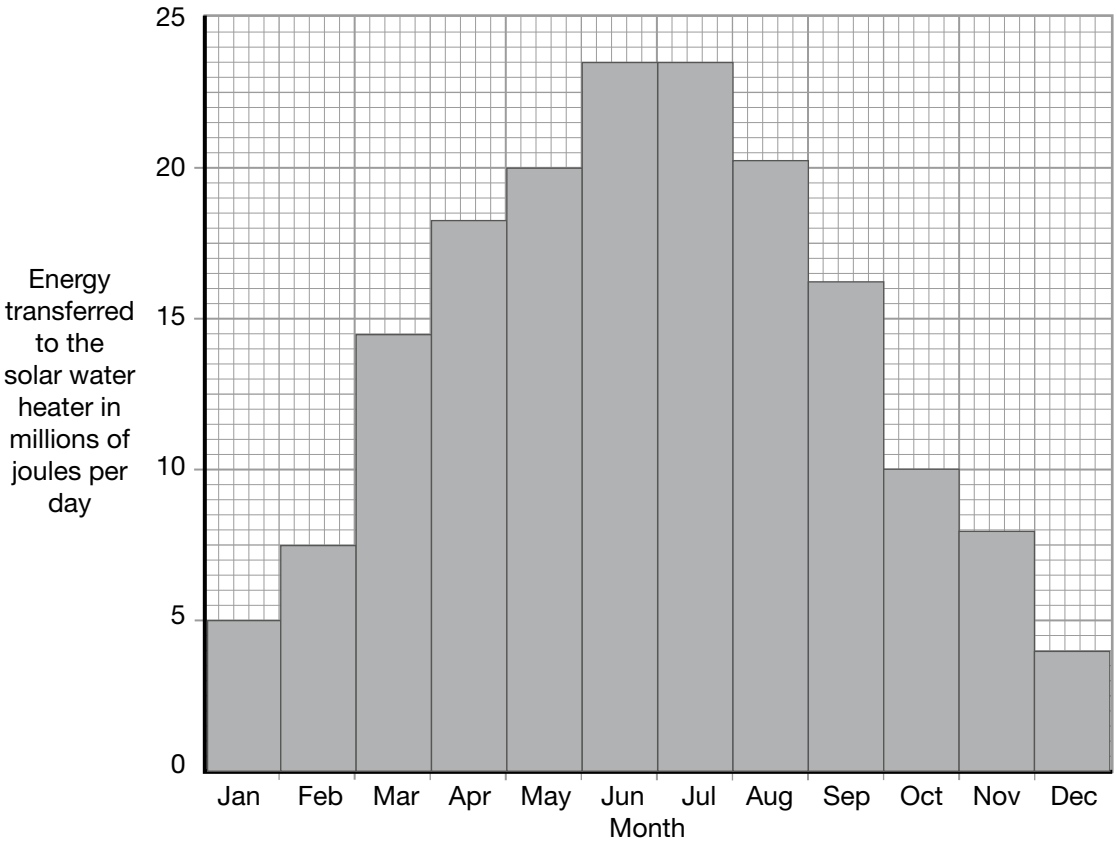
An example from Physics Unit 1

The picture shows one type of solar water heater. Water from the tank is slowly pumped through copper pipes inside the solar panel where the water is heated by energy from the Sun.



Each day the average European family uses 100 kg of hot water. It takes 16 800 000 J of energy to heat this mass of water to the correct temperature.

The bar chart shows how the amount of solar energy transferred to the water heater varies throughout the year.



In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

The water in the tank could be heated by using an electric immersion heater.

Outline the advantages and disadvantages of using solar energy to heat the water rather than using an electric immersion heater.

Mark Scheme

Question 11(d)

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 1.

0 marks	Level 1 1-2 marks	Level 2 3-4 marks	Level 3 5-6 marks
No relevant content.	There is a brief description of the advantages and disadvantages of using solar energy to heat the water rather than using an electric immersion heater, including either advantages or disadvantages from the **examples** below.	There is a description of some of the advantages **and** disadvantages of using solar energy to heat the water rather than using an electric immersion heater, with at least **one** advantage and **one** disadvantage from the **examples** below.	There is a clear, balanced and detailed description of the advantages **and** disadvantages of using solar energy to heat the water rather than using an electric immersion heater, with a minimum of **two** advantages and **two** disadvantages from the **examples** below.

examples of physics points made in response	extra information
advantages	
■ a renewable energy source	
■ energy is free	
■ does not pollute the atmosphere	Accept specific examples of polluting gases
■ no fuel is burnt	
■ energy can be stored (in the water)	
disadvantages	
■ only available in daylight hours	
■ availability fluctuates	Accept unreliable energy source
■ insufficient hours of sunlight in some countries	
■ average low intensity in some countries	

Example of a six mark answer

Level 3 marks

6 ✓

The immersion heater used electricity which has probably been produced by power stations that burn fossil fuels. The main advantage of the solar heater is that it uses a renewable energy source rather than fossil fuels. This means that no pollutants such as carbon dioxide and sulfur dioxide are released by the combustion of fuels. Carbon dioxide contributes to the greenhouse effect and sulphur dioxide contributes to the formation of acid rain.

The main disadvantage of the solar heater is that it only heats the water when daylight is available. On cloudy days the solar heater might not produce sufficient hot water for the family.

The graph shows that the solar heater will only heat sufficient water between April and September. This means that it must be supplemented by another source of heat such as an immersion heater during the rest of the year.

6/6

Marks awarded according to the following rationale

- It is clear from reading through this answer that the candidate has sound knowledge and understanding of the subject area, covering a wide range of the points in the mark scheme.
- The information is presented coherently and logically.
- The spelling, punctuation and grammar are very good.
- The answer contains a wide range of specialist terms correctly used, such as fossil fuel, renewable energy source, carbon dioxide, sulfur dioxide, greenhouse effect, acid rain.
- The candidate has covered both advantages and disadvantages, and there is a very clear distinction between them.
- The candidate has used all the information supplied to inform their answer, including data from the graph.
- This is clearly a high Level 3 answer, and has satisfied all of the criteria for 6 marks.

Example of a three mark answer

PHYSICS

Level 2 marks

3 ✓

The solar heater is the best because it dosn't use fuel and that means that it dosn't cause pollution. Energy from the sun is free.

It dosn't work at night so if you have run out of hot water you will have to use the imersion heater.

On the graph, the solar heater only heats the water in the summer.

3/6

Marks awarded according to the following rationale

- The candidate has some knowledge of the subject, and has referred to several of the scientific points in the mark scheme.
- The answer has some structure to it – advantages and disadvantages are given, and are separated.
- There are a number of errors in spelling and punctuation.
- Some technical terms are used (such as fuel and pollution), but the Sun does not qualify.
- The candidate has attempted to use the information supplied to inform their answer, and there is some reference to the graph. However, this is incomplete and rather weak.
- This is a Level 2 answer, but there is not enough in it to award top Level 2. It is therefore awarded 3 marks.

Example of a one mark answer

Level 1 marks

1 ✓

because

The solar heater is best ~~because~~ it does not cost anything to run like an imersion heater wher you have to pay for the ~~electric~~ and it does not ~~damege~~ the ~~atmosfere~~.

m e

electricity

damage atmosphere

1/6

PHYSICS

Marks awarded according to the following rationale

- There is very little in this answer, suggesting that Level 1 is the most likely area to find any marks.
- There is no structure to the answer.
- Spelling, punctuation and grammar are very weak.
- There is practically no use of specialist terms.
- The candidate has referred to two of the scientific points in the mark scheme – energy is free and pollution – but the reference to pollution is very weak.
- All of this means the response is at the bottom of Level 1 and merits only 1 mark.

Examination hints and tips
Candidates should:

Use paragraphs and full sentences.

In this type of question, divide the answer space into two then write 'Advantages' on the top line and 'Disadvantages' half way down the space. This will ensure that they address both parts of the question.

Include as many relevant specialist terms as possible, such as renewable energy source, fuel, pollution, carbon dioxide.

Use the information they are given in the question to inform/support their answer.

An example from Chemistry Unit 1

CHEMISTRY

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

There are millions of plastic bags in use. After use most of these plastic bags are buried in landfill sites. The amount sent to landfill could be reduced if the plastic bags:
- could be reused
- could be recycled by melting and making them into new plastic products
- could be burned to release energy.

Use the information above and your knowledge and understanding to give the positive and negative environmental impacts of using these methods to reduce the amount of plastic bags sent to landfill.

Mark Scheme

Question 8(c)

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 1.

0 marks	Level 1 1-2 marks	Level 2 3-4 marks	Level 3 5-6 marks
No relevant content.	There is a brief description of a positive and a negative environmental impact involved with one or more methods used to reduce the amount of plastic bags sent to landfill.	There is some description of both positive and negative environmental impacts involved with at least 2 methods used to reduce the amount of plastic bags sent to landfill.	There is a clear, balanced and detailed description of both a positive and a negative environmental impact of using each of the 3 methods used to reduce the amount of plastic bags sent to landfill.

examples of chemistry points made in response

reuse:

reuse means less bags used so:

positive environmental impact

- saves raw materials/crude oil
- saves energy/fuel
- cuts down on CO_2 emissions
- less global warming

negative environmental impact

- could cause litter
- could still be sent to landfill

---

recycle:

bags can be recycled so:

positive environmental impact

- used to make new plastic bags/objects
- saves raw materials/crude oil
- saves energy compared to producing plastic bags from crude oil
- cuts down on CO_2 emissions
- less global warming

negative environmental impact

- collection point/recycling sites cause an eyesore/litter problem
- transportation to recycling plant uses fuel or releases carbon dioxide/causes global warming
- melting plastic bags uses energy/fuel or releases carbon dioxide/causes global warming

---

burn:

bags can be burned so:

positive environmental impact

- could provide energy for heating buildings
- could provide energy for generating electricity

negative environmental impact

- increases CO_2 emissions
- increases global warming
- could release toxic gases
- does not conserve raw materials/crude oil

Example of a six mark answer

Level 3 marks

6 ✓

Reusing the plastic bags

Reusing the plastic bags reduces the amount of raw materials needed to produce plastics. It also reduces the amount of fuel used in the manufacture of plastics. Burning less fuel will reduce the amount of carbon dioxide released into the atmosphere. However, when the bag splits it may be dumped in a landfill.

Recycling the plastic bags

Recycling plastic bags also reduces the amount of raw materials used to produce plastics and the amount of fuel used in the manufacture of plastics. However, the recycling process requires energy from the combustion of fuel, and the carbon dioxide produced will enhance the greenhouse effect.

Burning the plastic bags

Burning the plastic bags releases carbon dioxide into the atmosphere, enhancing the greenhouse effect. The combustion may also release toxic gases. However, the energy released could be used to generate electricity, reducing the amount of fuel used.

6/6

Marks awarded according to the following rationale

- It is clear from reading through this answer that the candidate has sound knowledge and understanding of the subject area, covering a wide range of the points in the mark scheme.
- The information is presented coherently and logically.
- The spelling, punctuation and grammar are exemplary.
- The answer contains a wide range of specialist terms correctly used, such as raw materials, fuel, carbon dioxide, atmosphere, combustion, greenhouse effect, toxic, generate.
- The candidate has referred clearly to all three methods, and to both positive and negative effects on the environment.
- This is a top Level 3 answer, satisfying all of the criteria for 6 marks.

Example of a three mark answer

Level 2 marks

3 ✓

Both reusing the plastic bags and ~~reicling~~ recycling them reduce the amount of oil used to make plastic. This will reduce global warming because less carbon ~~dyoxide~~ dioxide will be ~~relesed~~ released but recycling plants are unsightly and they cause litter pollution. Reused bags get tatty and dirty and get ~~frown~~ thrown away in rubish for landfill.

3/6

Marks awarded according to the following rationale

- The candidate has some knowledge of the subject, and has referred to two of the processes, giving positive and negative points for both.
- There is some structure to the answer – positive effects and negative effects are given and separated out. However, the information is rather muddled, with the candidate going between reuse and recycling.
- There are a number of errors in spelling.
- Some technical terms are used (such as oil, global warming, carbon dioxide, pollution), and are referred to correctly.
- This is just sufficient for a Level 2 answer, and it is awarded 3 marks.

Example of a two mark answer

CHEMISTRY

Level 1 marks
2 ✓

Reusing is the best because we don't have to make ~~so~~ as many new plastics so we save on raw materials. Burning is worst ~~cos~~ because it causes pollution from poisonous gases being given off.

2/6

Marks awarded according to the following rationale

- There is very little in this answer, although an attempt has been made and an advantage and a disadvantage have been given.
- There is no structure to the answer.
- Spelling, punctuation and grammar are weak.
- There is practically no use of specialist terms.
- The candidate has referred to very few of the scientific points in the mark scheme.
- This response is clearly Level 1 and is worth only 2 marks.

Examination hints and tips
Candidates should:

Use paragraphs and full sentences.

In this type of question, divide the answer space into three then write 'Reusing' on the top line, 'Recycling' one third of the way down the space and 'Burning' two thirds of the way down the space. This will ensure that they address all three parts of the question.

Remember to give advantages and disadvantages for each process.

Include as many relevant specialist terms as possible, such as renewable energy source, fuel, pollution, carbon dioxide.

An example from Science B Unit 1

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Rock salt is a mixture containing salt (sodium chloride) that we get from the Earth's crust.

To get pure salt from rock salt we need to separate the pure salt from the other substances in the mixture.

Describe how you would obtain pure salt from rock salt in the laboratory. You should include in your answer the apparatus that you would use.

Mark Scheme

Question 9(b)

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 1.

0 marks	Level 1 1-2 marks	Level 2 3-4 marks	Level 3 5-6 marks
No relevant content.	There is a brief description of the laboratory procedure for obtaining a sample of pure salt from rock salt. The answer would not necessarily allow the procedure to be completed successfully by another person.	There is a description of the laboratory procedure for obtaining a sample of pure salt from rock salt that could be followed by another person. The answer must mention that the rock salt is mixed with water.	There is a clear, detailed description of the laboratory procedure for obtaining a sample of pure salt from rock salt that could easily be followed by another person. The answer must mention that the rock salt is mixed with water.

examples of biology points made in response

- crush the rock salt
- with a mortar and pestle
- mix the crushed rock with water
- in a beaker
- stir and warm to dissolve the salt
- filter the mixture to remove the undissolved solids
- using filter paper and funnel
- put the filtrate into an evaporating dish
- warm using Bunsen burner, tripod and gauze
- to evaporate to dryness

Example of a six mark answer

Level 3 marks

6 ✓

To make a sample of pure salt from rock salt you would first have to grind up the rock salt. You could use a pestle and mortar to do this. This would make it easier to dissolve the salt.

You would then mix the rock salt with hot water in a beaker and stir it up to dissolve the salt. The sand in the rock salt is not soluble so won't dissolve. You would have to make sure the water is not too hot then you would use a filter paper in a filter funnel to filter off the material that hasn't dissolved. You would put the clear filtrate into an evaporating dish and heat it on a tripod and gauze using a Bunsen burner. The tripod should be on a heat proof mat.

You must ~~nt~~ n't use a flame that is yellow or it will make the equipment black with soot. The flame should not be too hot either or the salt will spit. The water will evaporate to leave the pure dry salt crystals in the dish.

6/6

Marks awarded according to the following rationale

- It is clear that the candidate has a sound knowledge and understanding of the task, almost certainly having carried it out at some time.
- The procedure is clearly stated and all of the major items of equipment are named and used correctly.
- The procedure could be followed by another person with no difficulty.
- There is one (common) spelling error and one or two minor errors in punctuation.
- The answer is placed at Level 3, and is worth 6 marks.

Example of a three mark answer

Level 2 marks

3 ✓

I would use a Bunsen burner, a tripod, a gauze, a filter funnel, a beaker. I would stand the beaker on the tripod and gauze and heat it up using the Bunsen burner.

I would then pour the mixture through the filter funnel so the salty water would run through into the evaporating dish.

I would then put the dish on the tripod and heat it to boil off the water and leave dry salt. Oh I would have put filter paper in the funnel and given the rock salt in the beaker of water a stir to help it dissolve.

3/6

Marks awarded according to the following rationale

- The candidate clearly has some knowledge of the procedure.
- There is an attempt at organisation, although the sequence does contain some afterthoughts.
- A list of apparatus is given, although it is incomplete.
- It would be possible for another person to complete the task, even though a full list of apparatus is not given and some of the steps are given out of sequence.
- There are a number of spelling and punctuation errors, including in scientific terms.
- The answer is worthy of Level 2, but the weaknesses listed above would limit it to 3 marks.

Example of a one mark answer

Level 2 marks

1 ✓

I would mix the rock salt ~~wit~~ with water in a beaker to melt the salt and then filter it to get rid of the ~~waist~~ waste and then put it in a dish and then I would heat it under a Bunson burner on a tripod until the water dried up.

1/6

Marks awarded according to the following rationale

- There is very little in this answer, suggesting that Level 1 is the most likely area to find any marks.
- The spelling and punctuation are very poor.
- Some of the science is incorrect (eg melt rather than dissolve; heat under a Bunsen burner).
- Another person would struggle to follow this method.
- There is some attempt, though, and it does give the basic steps.
- This answer is the minimum that could be accepted for a Level 1 answer and is worth 1 mark.

Helpful websites and contact information

Free services

Ask AQA
We provide 24-hour access to useful information and answers to the most commonly asked questions at **aqa.org.uk/askaqa**. If the answer to your question is not available, you can submit a query through Ask AQA and we will respond within two working days.

e-AQA
e-AQA gives teachers access to useful resources such as Exampro Extra Online and Enhanced Results Analysis (ERA). To find out more about Exampro Extra Online, visit **sciencelab.org.uk/subjects** and register for ERA at **aqa.org.uk/eAQA-register**

The Science Lab
The Science Lab is constantly being updated with new ways to inspire your students. It's the place to visit for innovative support and resources. See for yourself at **sciencelab.org.uk**

Teacher Support meetings
Details of the full range of our Teacher Support meetings are available on our website at **aqa.org.uk/support-teachers**. You also have access to our fast and convenient online booking system at **events.aqa.org.uk/ebooking**

Speak to your subject team
You can talk directly to the GCSE Sciences subject team about all our GCSE Sciences specifications on **08442 090 415** or e-mail **science-gcse@aqa.org.uk**

For the latest information
Find out more, including the latest news, support and downloadable resources, at **aqa.org.uk**

Additional services

Nelson Thornes resources
Access to a range of textbooks, revision guides, online teaching, as well as learning and assessment materials is available at **nelsonthornes.com/aqagcse/science-2011.html**

Or contact Nelson Thornes –
e-mail **cservices@nelsonthornes.com**
or call **01242 267 287**

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales (company number 3644723) and a registered charity (registered charity number 1073334).

Registered address: AQA, Devas Street, Manchester M15 6EX.

Version 1.0

MSD1159.10