



**GCSE Additional Science 2**

**Foundation Tier**

**Unit 6F**

**SPECIMEN MARK SCHEME**

**Version 1.0**

## Quality of Written Communication and levels marking

In Question 9 candidates are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Candidates will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

### Level 1: basic

- 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: clear

- 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: detailed

- 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.

In order to attain a mark within a certain level, **both** the science **and** the QWC must be of a standard appropriate to that level.

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**COMPONENT NAME: GCSE Additional Science 2 Unit 6F**

**STATUS: Specimen V1.0**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>1(a)</b>	<b>C</b>		<b>1</b>
<b>1(b)</b>	<b>E</b>		<b>1</b>
<b>1(c)</b>	<b>B</b>		<b>1</b>
<b>Total</b>			<b>3</b>

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>2(a)</b>	proteases		<b>1</b>
	amino acids		<b>1</b>
<b>2(b)(i)</b>	14 minutes		<b>1</b>
<b>2(b)(ii)</b>	enzyme <b>Z</b>		<b>1</b>
<b>Total</b>			<b>4</b>

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<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>3(a)(i)</b>	dominant		1
<b>3(a)(ii)</b>	recessive		1
<b>3(b)(i)</b>	genes		1
<b>3(b)(ii)</b>	gametes		1
<b>Total</b>			<b>4</b>

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question	answers	extra information	mark						
4(a)	<table border="1"><tr><td>(X)</td><td>(XX)</td><td>XX</td></tr><tr><td>Y</td><td>XY</td><td>XY</td></tr></table>	(X)	(XX)	XX	Y	XY	XY	1 mark for Y in sperm box 1 mark if XX box correct 1 mark if both XY boxes correct	3
(X)	(XX)	XX							
Y	XY	XY							
4(b)	1:1 or 50% or $\frac{1}{2}$ or 0.5 or 1 in 2 or 1 out of 2 or 50 : 50	do <b>not</b> accept 50/50 accept equal (probability)	1						
<b>Total</b>			<b>4</b>						

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question	answers	extra information	mark		
5(a)	mitosis		1		
5(b)		<p>1 mark for each correctly ticked advantage up to a maximum of 2 marks</p> <p>1 mark for each correctly ticked disadvantage up to a maximum of 2 marks</p> <p>deduct 1 mark each for every incorrect box ticked in each column up to a maximum of 2 deductions in each column</p>	4		
				<b>Adv.</b>	<b>Disadv.</b>
	Stem cells can grow into many different kinds of body cells.			✓	
	Stem cells may grow out of control.				✓
	Large numbers of stem cells can be grown in the laboratory.			✓	
	Stem cells may be used to treat some human diseases.			✓	
Collecting and growing stem cells is expensive.		✓			
Patients treated with stem cells need to take drugs for the rest of their life to prevent rejection.		✓			
<b>Total</b>			<b>5</b>		

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<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>6(a)</b>	it is alkaline	accept alkali / basic / base	1
<b>6(b)(i)</b>	a salt		1
<b>6(b)(ii)</b>	nitric (acid)		1
<b>6(b)(iii)</b>	fertiliser		1
<b>6(c)</b>	because energy is taken in (from the surroundings)	second mark must be linked to energy	1 1
<b>Total</b>			<b>6</b>

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<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>7(a)</b>	a solid is formed		<b>1</b>
<b>7(b)(i)</b>	hydroxide		<b>1</b>
<b>7(b)(ii)</b>	3		<b>1</b>
<b>7(c)</b>	harmful (owtte)		<b>1</b>
<b>Total</b>			<b>4</b>

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<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>8(a)</b>	increase	accept 'go up'	1
<b>8(b)(i)</b>	decreases	in this order only	1
	increases		1
<b>8(b)(ii)</b>	it gives the particles more energy		1
	it makes the particles move faster		1
<b>Total</b>			<b>5</b>

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question	answers	extra information	mark
<b>9</b>			
<p>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 2.</p>			
<b>0 marks</b>	<b>Level 1 (1-2 marks)</b>	<b>Level 2 (3-4 marks)</b>	<b>Level 3 (5-6 marks)</b>
<p>No relevant content.</p>	<p>There is a brief description of the method or a risk assessment.</p>	<p>There is some description of the method that may include a risk assessment.</p>	<p>There is a clear, balanced and detailed description of the method and a risk assessment.</p>
<p><b>examples of chemistry points made in the response</b></p> <ul style="list-style-type: none"> <li>• sulfuric acid is heated in a <u>beaker</u> and copper oxide is added with stirring</li> <li>• until the copper oxide is in <u>excess</u></li> <li>• the mixture is <u>filtered</u> or the mixture is poured through a <u>funnel</u> and <u>filter paper</u></li> <li>• to remove the <u>excess</u> copper oxide</li> <li>• some of the solution is <u>evaporated</u> or heated in an <u>evaporating basin/dish</u></li> <li>• the solution is allowed to <u>crystallise / cool down</u></li> </ul> <p><b>examples of the risk assessment points made in the response</b></p> <ul style="list-style-type: none"> <li>• wear safety goggles – to protect eyes because sulfuric acid is corrosive / an irritant</li> <li>• care when heating – to protect against burns</li> <li>• wash hands after the preparation – copper sulfate is harmful</li> <li>• care when handling glass apparatus – to protect against cuts</li> </ul>		<p><b>extra information</b></p> <p>the underlined words are needed to gain each bullet point</p>	
<b>Total</b>			<b>6</b>



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<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>11(a)(i)</b>	all 3 correct kettle 13 A hair straighteners 3 A coffee maker 13 A	allow <b>1</b> mark for 2 correct	2
<b>11(a)(ii)</b>	fuse will (get hot and) melt causing the circuit to be broken	allow blow for melt do <b>not</b> accept snap/break	1 1
<b>11(b)</b>	230  50	in this order only	2
<b>11(c)(i)</b>	<b>L and N</b>	must have <b>both</b> answers for mark	1
<b>11(c)(ii)</b>	9 (volts)		1
<b>11(c)(iii)</b>	<b>M</b>		1
<b>11(d)(i)</b>	the hairdryer is double insulated	accept has a plastic cover	1

**Question 11 continues on the next page . . .**

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**Question 11 continued . . .**

11(d)(ii)	1150	allow <b>1</b> mark for substitution into correct equation ie $5 \times 230$  allow <b>both</b> marks for 1.15 provided the unit is changed to kW	2
<b>Total</b>			<b>12</b>

question	answers	extra information	mark
12			4
<b>Total</b>			<b>4</b>

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question	answers	extra information	mark
<b>13(a)</b>	any <b>three</b> from: <ul style="list-style-type: none"><li>oxygen used in aerobic respiration</li><li>more energy from aerobic respiration</li><li>carbon dioxide and water are end products of aerobic respiration</li><li>lactic acid is end product of anaerobic respiration</li></ul>		<b>3</b>
<b>13(b)</b>	(Student Y) had <ul style="list-style-type: none"><li>the lower resting heart rate</li><li>the lower heart rate increase and</li><li>the quicker recovery time</li></ul>	accept converse for student X	<b>1</b> <b>1</b> <b>1</b>
<b>13(c)</b>	when exercising the rate of respiration (in the muscles) is higher (the increased heart rate delivers) more oxygen to the (respiring) muscles (the increased heart rate delivers) more glucose to the (respiring) muscles and results in faster removal of carbon dioxide and lactic acid		<b>1</b> <b>1</b> <b>1</b> <b>1</b>
<b>Total</b>			<b>10</b>

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<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>14(a)</b>	because carbon dioxide is produced	accept gas is produced	1
	carbon dioxide / gas escapes, therefore the mass of the flask and contents decreases		1
<b>14(b)(i)</b>	balance B		1
<b>14(b)(ii)</b>	the balance is measuring small changes in mass		1
<b>14(c)(i)</b>	sensible curve missing anomalous point		1
<b>14(c)(ii)</b>	7 minutes		1
<b>14(c)(iii)</b>	answer in the range of 100.35 – 100.5		1
<b>14(d)</b>	the (marble) powder has a larger surface area than the (marble) chips		1
	therefore there would be more collisions with the acid particles (within the same amount of time)		1
<b>Total</b>			<b>9</b>

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question	answers	extra information	mark
15(a)(i)	cosmic		1
15(a)(ii)	longer the flight time, greater the dose	accept positive correlation do <b>not</b> accept directly proportional	1
15(a)(iii)	accept any value between 0.055 and 0.062 inclusive		1
	receive higher dose than an 8 hour flight but less than an 11 hour flight		1
15(b)	he should not be concerned because additional dose is very small (1.5) / additional dose is only 1.5	accept 0.75 for 1.5	1
	which is well below the dose that may cause cancer		1
15(c)	almost the same number of non-aircrew developed leukaemia /cancer		1
	therefore other factors could be involved	accept specific examples for either aircrew or other sample	1
<b>Total</b>			<b>8</b>