

GCSE

Additional Applied Science

Unit **A191/01**: Science in Society (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2014

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.











OCR will not enter into any discussion or correspondence in connection with this mark scheme.





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These are the annotations, (including abbreviations), including those used in scoris, which are used when marking
Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt

	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Subject-specific Marking Instructions

- a. If a candidate alters his/her response, examiners should accept the alteration.
- b. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

c. The list principle:
 If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

d. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

MARK SCHEME:

Question		Answer			Mark	Guidance										
1	a	where	what is used	what may be produced	2	<u>1 mark for each correct line</u> <u>More than 1 line loses the mark.</u>										
		cells	<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">carbon dioxide and lactic acid</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">glucose and lactic acid</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">oxygen and carbon dioxide</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">glucose and oxygen</div>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">carbon dioxide and lactic acid</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">glucose and lactic acid</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">oxygen and carbon dioxide</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">glucose and oxygen</div>												
	b		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">lungs</td><td style="width: 50%; text-align: center;">✓</td></tr> <tr><td>heart</td><td></td></tr> <tr><td>brain</td><td></td></tr> <tr><td>muscles</td><td></td></tr> </table>	lungs	✓	heart		brain		muscles			1	<u>Accept any indication of a correct response.</u> <u>More than 1 response = zero marks.</u>		
lungs	✓															
heart																
brain																
muscles																
	c		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">carbon dioxide</td><td style="width: 50%;"></td></tr> <tr><td>urea</td><td style="text-align: center;">✓</td></tr> <tr><td>lactic acid</td><td></td></tr> <tr><td>water</td><td style="text-align: center;">✓</td></tr> <tr><td>faeces</td><td></td></tr> </table>	carbon dioxide		urea	✓	lactic acid		water	✓	faeces			2	<u>Accept any indication of a correct response.</u> <u>Minus 1 mark for each additional incorrect response.</u>
carbon dioxide																
urea	✓															
lactic acid																
water	✓															
faeces																

Question	Answer	Mark	Guidance
2	<p>[Level 3] <u>Answer includes one or more points from three areas. Example, description of method and explanation given in some detail.</u> Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] <u>Answer includes one or more points from two areas. Example and method described in some detail.</u> Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] <u>Answer includes one or more points from one area. No example given but some description of methods.</u> Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to E Level 3 may also include for example:</p> <ul style="list-style-type: none"> • to ensure all the available evidence is collected • to ensure record is kept at which part of crime scene they were collected from and when • because deterioration will destroy evidence • because contamination will destroy evidence • prevent evidence being changed <p><u>Relevant scientific points concerning what they did with samples</u> Level 2 may also include for example: For six marks must have two points from this area.</p> <ul style="list-style-type: none"> • <u>idea of examining or analysing or testing</u> (Ignore prepare / find out / check) • <u>using named appropriate equipment</u> • <u>idea of identification</u> • <u>idea of comparison with known samples</u> collect blood from different parts of crime scene • label phials of blood samples • get samples to lab ASAP • use sterile collecting bags • seal bags <p><u>Relevant scientific points concerning why the sample was collected in that way:</u></p> <ul style="list-style-type: none"> • <u>to ensure record is kept of where OR when OR who, sample was collected.</u> • <u>avoid tampering with samples</u> • <u>avoid contamination samples</u> • <u>because contamination will destroy sample</u> • <u>prevent deterioration of samples</u> • <u>because deterioration will destroy sample</u> <p><u>Relevant points concerning collection of samples</u> Level 1 may include:</p> <ul style="list-style-type: none"> • <u>type of sample named</u>

Question	Answer	Mark	Guidance
			<ul style="list-style-type: none"> • <u>wear gloves/suitable clothing</u> • <u>use of suitable equipment</u> • <u>placed in suitable container</u>.collect representative samples • label / <u>number the sample</u>. • <u>seal sample</u> / secure / locked • <u>use sterile collecting container</u> • <u>get samples to lab ASAP</u> • prevent deterioration of samples • avoid contamination samples • avoid tampering with samples <p><u>CARE Do not credit for just saying “collect, store, prepare”</u></p>

Question		Answer	Mark	Guidance
3	a	Idea of putting them in order of seriousness / <u>who should be seen first OR correct explanation of why even if order is wrong</u> ; <u>THEN any 2 from:</u> A first before C with explanation; C second; B last; C before B with explanation	3	Idea of triage or explanation for order. Max 2 marks from this section ie A first, C second, B third = 2 marks
	b	i	3	Idea of doctor listening <u>Ignore name, address, next of kin, age etc.</u> Do not credit 'length of time unconscious' <u>Medical details must be historical and not related to current injury.</u>
	b	ii	2	Idea of doctor talking <u>Ignore any questions concerning the patient as this is examined in bi</u>
4	a	Idea of calibrate scales / adjust to make accurate / <u>use same scales</u> ; Take measurement same time / day (each week) / before meal; Not wear clothing / idea of not wearing much clothing / same clothing;	3	
	b	i	3	4.17 or 4 scores 2 marks
	b	ii	2	Ignore units for 114 Units not required BUT do not credit incorrect units.
	b	iii	1	<u>Ignore going to the gym unless qualified with specific exercise</u>

Question		Answer	Mark	Guidance															
5	a	Normal	1																
	b	<table border="1"> <caption>Bar Chart Data</caption> <thead> <tr> <th>Year</th> <th>Bar 1 (Approx. Value)</th> <th>Bar 2 (Approx. Value)</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>105</td> <td>65</td> </tr> <tr> <td>2012</td> <td>110</td> <td>70</td> </tr> <tr> <td>2013</td> <td>125</td> <td>70</td> </tr> <tr> <td>2014</td> <td>130</td> <td>90</td> </tr> </tbody> </table>	Year	Bar 1 (Approx. Value)	Bar 2 (Approx. Value)	2011	105	65	2012	110	70	2013	125	70	2014	130	90	2	<p>1 mark for each correct bar</p> <p><u>First bar less than halfway between 120 and 140</u></p> <p><u>Second bar less than halfway between 80 and 100</u></p> <p>If you need to carefully consider whether it is below half way then do not award the mark.</p>
Year	Bar 1 (Approx. Value)	Bar 2 (Approx. Value)																	
2011	105	65																	
2012	110	70																	
2013	125	70																	
2014	130	90																	
	c	<p><u>Idea</u> it has been increasing (each year) / <u>highest ever</u>; Now nearly in high blood pressure range</p>	2	<p><u>Ignore up and down</u></p> <p>Ignore consequences of high blood pressure</p>															

Question	Answer	Mark	Guidance
6	<p>[Level 3] <u>Point or points from all three areas. More detailed description of role of physiotherapist to include assessment, recovery and good practice.</u> Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] <u>Point or points from two areas. Some detail of role of physiotherapist to include assessment and recovery.</u> Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] <u>Point or points from one area. General description that physiotherapist aids recovery / treatment.</u> Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Recovery / treatment may include:</p> <ul style="list-style-type: none"> • devise exercises • help patient carry out exercises • exercises specific for ankle injury • exercises specific for maintain muscle strength and suppleness <p>Assessment may include:</p> <ul style="list-style-type: none"> • <u>examine the ankle / surgery</u> • discuss with patient determine the nature of the injury • <u>find out what patient can do</u> • prospects for recovery decide best exercise to aid recovery • examine X rays / medical report <p>Recovery / treatment may include:</p> <ul style="list-style-type: none"> • devise exercises / therapy / give advice • massage • practically help patient carry out exercises • exercises specific for maintain muscle / joint strength or suppleness • repeated visits to physiotherapist <p>Good practice may include:</p> <ul style="list-style-type: none"> • develop detached but personal relationship with patient • make judgements when a patients statements conflict with evidence • recognise the importance of team work • consider the whole context i.e. person, family, workplace and community. <p>Use the L1, L2, L3 annotations in Scoris; do not use</p>

Question	Answer	Mark	Guidance
			ticks.

Question		Answer		Mark	Guidance
7	a	chromatography		1	<u>Accept any indication of a correct response.</u> <u>Two responses = zero marks.</u>
		filtration			
		electrophoresis	✓		
		checking blood group			
	b	Idea that second band is too narrow / <u>less black / more white / idea that it is similar</u> ; D is a better match;		2	<u>Must give specific reason.</u>
	c	Individuals have a right to privacy.	✓	2	3 correct = 2 marks 2 correct = 1 mark Minus 1 mark for each additional incorrect answer
Different kinds of data may be collected.					
The data may be used by other organisations.		✓			
Only scientists are used to collect the data.					
A person may be unaware that data is held.		✓			
The Government passes laws to regulate data collection.					
Computers are used to store the information.					

Question	Answer	Mark	Guidance
8	<p>[Level 3] A detailed description of a method that would work to <u>separate/identify</u> a substance <u>AND</u> plus an explanation of how the unknown substance would be identified <u>AND dots above water level made explicit.</u> Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] A description of a method that would work to <u>separate/identify</u> an unknown substance. <u>Use idea of dots above or below water level for 3 or 4 marks.</u> Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] General description of an incomplete method. <u>Ignore dots and water level.</u> Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Points may include:</p> <ul style="list-style-type: none"> • draw start line • spot known substances onto start line. • spot unknown substance onto start line • place solvent in tank • place paper in solvent with start line above solvent. • leave to develop • stop when solvent front is near to top of paper • dry / develop chromatogram • calculate R_f value • compare colour of substances to spot known / unknown with same R_f value • identify unknown • possibly rerun with different solvent or use 2-way chromatography to confirm <p>Look at both text and / or diagram when allocating levels. <u>Dripping water onto dye on filter paper = max L1</u></p> <p><u>Descriptions of other testing methods such as litmus, BDH universal, colorimetry etc. do not score tails about how chromatography works are not required.</u></p> <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553

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