

## **GCSE**

### **Additional Applied Science**

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

General Certificate of Secondary Education

### **Mark Scheme for June 2015**

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

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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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### Annotations







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
<b>not/reject</b>	answers which are not worthy of credit
<b>ignore</b>	statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	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

<b>Edinburgh</b>	
<b>Manchester</b>	
<b>Paris</b>	
<b>Southampton</b>	

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).

<b>Edinburgh</b>			✓			✓	✓	✓	✓	
<b>Manchester</b>	✓	x	✓	✓	✓				✓	
<b>Paris</b>				✓	✓		✓	✓	✓	
<b>Southampton</b>	✓	x		✓		✓	✓		✓	
<b>Score:</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NR</b>

Question		Expected Answers	Marks	Additional Guidance
1	a	tennis club    leisure centre;  <i>any two from...</i> coach / trainer / instructor / first aider;	2	Accept training session / coaching / training / instructing
	b	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">FITNESS TRAINER at fitness centre</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">LIFE GUARD at swimming pool</div> </div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">prevent drowning</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">give medical advice</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">put out fires</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">give financial advice</div> <div style="border: 1px solid black; padding: 5px;">improve stamina and flexibility</div> </div>	2	
	c	Must ensure training / equipment does not <b>harm</b> the person;	1	
	d	Lifestyle – e.g. smoking / drinking;  Health – e.g. disease / illness / injuries or example;  Fitness – strength / stamina / flexibility / (recovery after) exercise;	3	Accept diet qualified e.g, healthy / unhealthy diet /fatty foods  Ignore "health problems" Accept 'mental health problems'  Ignore examples of exercise eg running / swimming / aerobics etc.
		<b>Total</b>	<b>[8]</b>	

Question			Expected Answers	Marks	Additional Guidance								
2	a	i	80÷2 <sup>2</sup> / 80÷4; 20;	2	20 on its own scores 2 Ignore units								
		ii	<table border="1"> <tr> <td>healthy weight</td> <td>✓</td> </tr> <tr> <td>obese</td> <td></td> </tr> <tr> <td>underweight</td> <td></td> </tr> <tr> <td>overweight</td> <td></td> </tr> </table>	healthy weight	✓	obese		underweight		overweight		1	ecf  underweight < 18.5 normal 18.5 – 24.9 overweight 25 – 29.9 obese >30
healthy weight	✓												
obese													
underweight													
overweight													
	b		<p><i>Any 4 from....</i> pulse / heart rate; temperature; blood pressure; gender / age / DOB; full name / address; does he smoke; does he drink; medical history / allergies / asthma; medication; tests e.g blood / urine / MRSA / Xray / scans;</p>	3	4 or 3 scores 3 marks 2 scores 2 1 scores 1  Ignore 'health'								
			<b>Total</b>	<b>[6]</b>									



Question	Expected Answers	Marks	Additional Guidance
3	<p><b>[Level 3]</b> Detailed comments refer to just <b>explanation AND justification</b>. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p><b>[Level 2]</b> Comments refer to just <b>explanation AND justification</b>. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p><b>[Level 1]</b> Comments refer to just <b>explanation OR justification</b>. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p><b>[Level 0]</b> 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>Scientific points related to <u>justification</u> of decision:</p> <p><b>If candidate says Shelly is wrong then MAX 3</b></p> <ul style="list-style-type: none"> <li>• (Chart) shows meal / eat</li> <li>• Some food digested to glucose</li> <li>• Carbohydrates</li> <li>• Level rises just after meal then level falls</li> </ul> <p><b><u>Explanation</u> of why it is not oxygen / carbon dioxide / lactic acid</b></p> <ul style="list-style-type: none"> <li>• (Chart) does not refer to exercise</li> <li>• lactic acid only produced during anaerobic respiration / exercise</li> <li>• person was laying down</li> <li>• levels would not have such a big rise and fall / stay almost the same</li> </ul> <p><b>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</b></p>
	<b>Total</b>	<b>[6]</b>	

Question			Expected Answers	Marks	Additional Guidance								
4	a	i	15 <sup>th</sup> ;	1									
		ii	85% weigh more; 15% weigh less;	2	ecf								
		iii	<i>Any 1 from:</i> Yes or no qualified correctly e.g. YES – underweight; e.g. NO -Maybe as she is 10 month old and could be average next year / some babies do not put on weight easily;	1	Yes or no without qualification scores 0 marks  Accept – 'No, only 1kg below average'								
		iv	<table border="1"> <tbody> <tr> <td>5th</td> <td></td> </tr> <tr> <td>25th</td> <td></td> </tr> <tr> <td>50th</td> <td>✓</td> </tr> <tr> <td>75th</td> <td></td> </tr> </tbody> </table>	5th		25th		50th	✓	75th		1	
5th													
25th													
50th	✓												
75th													
	b		<i>Any two from.....</i> APGAR;  Height / length; Developmental tests; Heart beat / pulse / blood pressure;	2	Ignore temperature / blood tests Allow one letter missing from 'APGAR' or letters not in correct order  Accept example eg reaction to light / sound								
			<b>Total</b>	<b>[7]</b>									

Question	Expected Answers	Marks	Additional Guidance
5	<p><b>[Level 3]</b> Explains three areas. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p><b>[Level 2]</b> Explains two areas. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p><b>[Level 1]</b> Explains one area. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p><b>[Level 0]</b> Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p><b>This question is targeted at grades up to E</b></p> <p><b>Explanation of accreditation may include:</b></p> <ul style="list-style-type: none"> <li>• idea of stamp of approval</li> <li>• gives client confidence</li> </ul> <p><b>Explanation of common practice and procedures may include:</b></p> <ul style="list-style-type: none"> <li>• get same results each time / reliable</li> <li>• other people get same results</li> </ul> <p><b>Maintenance and checking may include:</b></p> <ul style="list-style-type: none"> <li>• more accurate results / not make errors /no invalid evidence</li> <li>• calibration check</li> <li>• more precision</li> </ul> <p><b>Training may include:</b></p> <ul style="list-style-type: none"> <li>• Health &amp; Safety</li> <li>• using equipment</li> <li>• understanding / carrying out procedures / know what to do</li> </ul> <p><b>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</b></p>
	<b>Total</b>	<b>[6]</b>	

Question			Expected Answers	Marks	Additional Guidance
6	a	i	Acid; Blue litmus turns red;	2	
		ii	Qualitative; Does not give quantity / yes-no result / only tells acid or alkali;	2	Accept "not numbers"
	b		A - -; B - ✓; C ✓ ✓; (2)  C (is river water) (1)	3	Do not accept words in place of ticks 1 mark for each correct column
<b>Total</b>				<b>[7]</b>	

Question			Expected Answers	Marks	Additional Guidance
7	a		<p><b>[Level 3]</b> Refers in detail to both support and not support. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p><b>[Level 2]</b> Refers to both support and not support. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p><b>[Level 1]</b> Refers to only support OR not support. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p><b>[Level 0]</b> Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p><b>This question is targeted at grades up to C</b></p> <p><b>Supports conclusion</b></p> <ul style="list-style-type: none"> <li>• look the same</li> <li>• uses scale to show both are same size/similar size</li> <li>• both round / spherical / same shape</li> <li>• both have spikes</li> </ul> <p><b>Does not support conclusion</b></p> <ul style="list-style-type: none"> <li>• unknown has fewer spikes / ORA</li> <li>• cannot compare colour</li> <li>• different flowers may produce similar pollen grains</li> <li>• em has hemispheres / round things</li> </ul> <p><b>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</b></p>

	<b>b</b>	<table border="1"> <tbody> <tr> <td data-bbox="383 204 956 277">produces less detail than a light microscope</td> <td data-bbox="956 204 1032 277"></td> </tr> <tr> <td data-bbox="383 277 956 341">kills biological samples</td> <td data-bbox="956 277 1032 341">✓</td> </tr> <tr> <td data-bbox="383 341 956 405">complicated sample preparation</td> <td data-bbox="956 341 1032 405">✓</td> </tr> <tr> <td data-bbox="383 405 956 469">requires a solvent to separate the colours</td> <td data-bbox="956 405 1032 469"></td> </tr> <tr> <td data-bbox="383 469 956 533">very expensive equipment to install and use</td> <td data-bbox="956 469 1032 533">✓</td> </tr> <tr> <td data-bbox="383 533 956 596">cannot be carried around</td> <td data-bbox="956 533 1032 596">✓</td> </tr> <tr> <td data-bbox="383 596 956 676">can only be used on large biological samples</td> <td data-bbox="956 596 1032 676"></td> </tr> </tbody> </table>	produces less detail than a light microscope		kills biological samples	✓	complicated sample preparation	✓	requires a solvent to separate the colours		very expensive equipment to install and use	✓	cannot be carried around	✓	can only be used on large biological samples		<b>2</b>	4 correct = 2 marks 3 or 2 correct = 1 mark
produces less detail than a light microscope																		
kills biological samples	✓																	
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Chromatograms do not magnify. Electron micrographs do.	✓																	
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Chromatograms do not depend upon colours. Electron micrographs do.																		
		<b>Total</b>	<b>[10]</b>															
		<b>Paper total</b>	<b>50</b>															

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