

GCSE

Additional Applied Science

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

General Certificate of Secondary Education

Mark Scheme for June 2016

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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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Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/ = 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

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks
work done lifting = 1 mark
change in potential energy = 0 marks
gravitational potential energy = 1 mark

5. Annotations:
The following annotations are available on RM ASSESSOR.

✓ = correct response
× = incorrect response
bod = benefit of the doubt
nbod = benefit of the doubt **not** given
ECF = error carried forward
^ = information omitted
I = ignore
R = reject

6. If a candidate alters his/her response, examiners should accept the alteration.
7. 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. Put ticks (✓) in the two correct boxes. Put ticks (✓) in the two correct boxes.

✓
✗

This would be worth 0 marks.

✗
✗

This would be worth one mark.

✗
✗
✓
✓

This would be worth one mark.

8. 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.

9. 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

Question			Expected Answers	Marks	Additional Guidance
1	a	i	Red (blood) <u>cells</u> ; Fight disease; Clots blood;	3	allow fight infection/invading microbes/protects from disease ignore scabs
		ii	Bone; Cartilage; Ligament; Tendon; Muscle;	3	any three correct = 3 marks any two correct = 2 marks any one correct = 1 mark
		iii	Heart; Lungs;	2	
	b		100 / 20; 5;	2	5 = 2 marks ignore units

Question	Expected Answers	Marks	Additional Guidance
c	<p>[Level 3] Comments include linked references for muscle fitness / aerobic fitness. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Comments include at least two references to muscle fitness / aerobic fitness or one linked point. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Comments include a reference to either muscle fitness or aerobic fitness. 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</p> <p>Scientific points regarding MUSCLE fitness may refer to:</p> <ul style="list-style-type: none"> • lifting weights • sit-ups • exercise for leg muscles eg squat thrusts • push-ups • <i>swimming / rowing / cycling</i> <p>Scientific descriptions regarding AEROBIC fitness may include:</p> <ul style="list-style-type: none"> • running • sprints • step ups / interval training allow named example eg bleep test • <i>swimming / rowing / cycling</i> <p>If exercise is correctly LINKED to muscle fitness or aerobic fitness then L3. e.g. running improves aerobic fitness OR lifting weights improves muscles</p> <p>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</p>
	Total	[16]	

Question			Expected Answers	Marks	Additional Guidance
2	a		Doctor - idea of knowledge / qualification; - idea of what they do / treatment; Nutritionist - idea of knowledge / qualification; - idea of what they do / treatment ; Pharmacist - idea of knowledge / qualification; - idea of what they do / treatment ; Optician - idea of knowledge / qualification; - idea of what they do / treatment ; Dentist - idea of knowledge / qualification; - idea of what they do / treatment;	4	No mark for job title 1 mark for scientific knowledge and 1 mark for technical skill What they know about What they do
	b	i	9;	1	

Question	Expected Answers	Marks	Additional Guidance
ii	<p>[Level 3] Comments include points from APGAR and points from conclusion. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Comments include a point from conclusion. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Comments include a point from APGAR. 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</p> <p>Scientific points regarding APGAR may refer to:</p> <ul style="list-style-type: none"> • 4 or 5 different observations • each observations scores out of 2 • scores are totalled / out of 10 • 8 or above is OK (allow 7 – 10) • carried out shortly after the baby is born <p>Scientific points regarding CONCLUSION may include:</p> <ul style="list-style-type: none"> • makes a recommendation for no intervention • Baby scores above 8 / 9 • conclusion is wrong / baby is OK <p>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</p>
	Total	[11]	

Question		Expected Answers	Marks	Additional Guidance
3	a	<p>[Level 3] Comments include points from both rivers and a correct conclusion. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Comments include points from both rivers. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Comments include points from one river. 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>Scientific points regarding RIVER A may refer to:</p> <ul style="list-style-type: none"> • reference to turbidity/ quantity of suspended material • water is (slightly) alkaline • blood worm found • no other organism found • only one type of organism found • Water contains low levels of oxygen <p>Scientific points regarding RIVER B may include:</p> <ul style="list-style-type: none"> • reference to clear water / no turbidity • water is acidic • blood worms not found • named other organisms found • more organisms found • high oxygen content to support variety of organisms living in river <p>Conclusion:</p> <ul style="list-style-type: none"> • River A is polluted / not clean / dirty Accept any idea of A being worse (than B) • River B is not polluted / clean / healthy Do not accept clear Accept any idea of B being better (than A) • If comparison, both rivers required for two conclusions e.g. River B is cleaner than A = 2 conclusions <p>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</p>
	b	i	2	
		ii	2	
		Total	[10]	

Question		Expected Answers	Marks	Additional Guidance	
4	a	<div style="display: flex; flex-wrap: wrap;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">a sharp image</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">The photograph was in black and white.</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">good contrast</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">The photograph was in focus.</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">good depth of field</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">A zoom lens was used.</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">showed small detail</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Both close and far objects were in focus.</div> </div>	3	4 correct = 3 marks 3 or 2 correct = 2 marks 1 correct = 1 mark	
	b	i	15 x 9; 135;	2	135 scores 2 marks Calculation 1 mark
		ii	Idea of error in measurement; Idea of error in calculation;	2	Accept two different examples of error in measurement for 2 marks. Ignore reliability
Total			[7]		

Question		Expected Answers	Marks	Additional Guidance
5	a	C; D;	2	
	b	(reference material is) Banned food dye; Idea of comparison with unknown;	2	
	c	Different dyes may have same colour; Different dyes may have same Rf;	2	Allow B is darker than D (from chromatogram) Ignore sweets B&D have same Rf value
Total			[6]	
Paper total			50	

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