OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Applied Science

General Certificate of Secondary Education

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

Mark Scheme for January 2013

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.

Annotations

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	credit alternative wording / or words to that effect
ORA	or reverse argument

Available in scoris to annotate scripts:

	indicate uncertainty or ambiguity
BOD	benefit of doubt
CON	contradiction
	incorrect response
ECF	error carried forward
	draw attention to particular part of candidate's response
NBOD	no benefit of doubt
R	reject

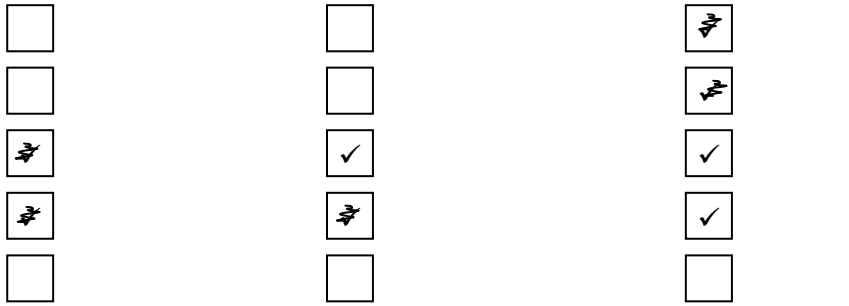
✓	correct response
L1 , L2 , L3	indicate level awarded for a question marked by level of response
^	information omitted

Subject-specific Marking Instructions

a. Accept any clear, unambiguous response (including mis-spellings of scientific terms if they are *phonetically* correct, but always check the guidance column for exclusions).

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.

eg for a one-mark question where ticks in the third <u>and</u> fourth boxes are required for the mark:



This would be worth 1 mark. *This would be worth 0 marks.* *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-box questions:

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 and other markings. If there are no ticks, accept clear, unambiguous indications, eg shading or crosses. Credit should be given according to the instructions given in the guidance column for the question. 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 cities in England:

Edinburgh	
Manchester	
Paris	
Southampton	

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

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**NR**

e. For answers marked by levels of response:

i. **Read through the whole answer from start to finish**

ii. **Decide the level** that **best fits** the answer – match the quality of the answer to the closest level descriptor

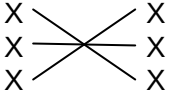
iii. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
A good match to the level descriptor	The higher mark in the level
Just matches the level descriptor	The lower mark in the level

iv. Use the **L1**, **L2**, **L3** annotations in Scoris to show your decision; do not use ticks.

Quality of Written Communication skills assessed in 6-mark extended writing questions include:

- appropriate use of correct scientific terms
- spelling, punctuation and grammar
- developing a structured, persuasive argument
- selecting and using evidence to support an argument
- considering different sides of a debate in a balanced way
- logical sequencing.

Question			Answer	Marks	Guidance
1	(a)			2	3 lines correct = 2 mark 2 or 1 lines correct = 1 mark
	(b)	(i)	plots correct;;	2	Minus 1 mark for each error. Plots to within a half grid square. Candidate cannot score less than zero
		(ii)	180 – 240 seconds;	1	
		(iii)	(yes) because..... her pulse rate is lower; returns to normal quicker; OR supported by data from graph eg Dave's is 140 and Gill's is 130/ Gill's returns to normal by 120 seconds;	2	Reject NO as zero marks **Accept** pulse is lower AND returns to normal quicker for 2 marks. Reference to curve higher/lower insufficient for any marks ORA
		(iv)	any 2 from: monitor performance; design appropriate fitness programme; health and Safety argument eg do not over exercise; know what they are capable of; in case they have a different trainer;	2	**Ignore** comments on lifestyle and health.
			Total	**9**	

Question			Answer	Marks	Guidance
2			**Level 3 (5–6 marks)** Answer includes some correct labels / drawing AND some correct mechanism points. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Answer includes some correct labels / drawing AND some points concerning route. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Answer includes a correct label / drawing. AND A point from correct route. OR two points from correct route. OR two points from correct labels. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to C** **relevant scientific points concerning labels may include:** • Ribs • Intercostal muscles • Diaphragm • Lungs • Trachea • Bronchus / bronchioles **relevant scientific points concerning mechanism may include:** • ribs – move up to reduce pressure/increase volume • intercostal muscles – contract to move ribs upwards • diaphragm – contracts to increase volume and reduce pressure in lungs • reduced pressure causes air to be pushed into lungs from atmosphere **relevant scientific points concerning route may include:** • air through nose and mouth • down trachea • into bronchus / bronchioles / lungs • idea of gas exchange Use ecf for incorrect labels when looking for mechanism or route points. **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**6**	

Question			Answer	Marks	Guidance
3	(a)	(i)	*Any two from three:* red blood cells carry oxygen; white blood cells fight disease; platelets clot blood;	2	
		(ii)	too large; to pass through (membrane);	2	
	(b)		regulate water level; remove urea / produce urine; toxic by-products / waste;	2	**Ignore** filter/ clean blood/ filter urine **Allow** poison for toxic
			Total	**6**	

Question			Answer	Marks	Guidance
4	(a)	(i)	egg labelled on LHS or RHS;	1	
		(ii)	labelled anywhere on fallopian tube;	1	
		(iii)	anywhere in or touching uterus wall;	1	
	(b)	(i)	**7**	1	If no answer on line accept 7in the bottom box.
		(ii)	baby is OK / normal;	1	7and above, is normal 4–6 is fairly low 3 and below, is critical Treat monitoring as neutral for APGAR of 7. **ecf** so answers for (bi)should match levels indicated above
		(iii)	*Any 2 from:* Idea that hard to tell skin colour/ best guess; Idea that pulse rate scores 1 even if only 1 beat per min; Idea of difference between feeble cry and a cry; Idea of difference between bends easily and bends with resistance; Idea of difference between weak and regular breathing; Idea that baby's condition /score could change; Categories quite close / needs to be subdivided; Only one medic's opinion / more than one medic should do it; Score could be between 1 or 2;	2	**Ignore** repeat the test unless linked to two medics **Ignore** someone 'got it wrong'
	(c)		any idea of benefit to the patient; outweighs the risk;	2	"to save baby from even bigger risk" = 2 marks
			Total	**9**	

Question			Answer	Marks	Guidance
5			**Level 3 (5–6 marks)** Answer includes some points from all three areas of relevant points. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Answer includes a point or points from two areas. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Answer includes a point or points from one area. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to E** **relevant scientific points concerning how collected may include:** • place (fibres) in container • label samples (of fibres) **relevant scientific points concerning why they were collected in that way, may include:** • prevent deterioration of fibres • suitable precautions to avoid contamination at scene eg tweezers, gloves, • avoid contamination during testing and storage • avoid tampering. **relevant scientific points concerning what they did with them may include:** • idea of examining / analysing fibres • look at with microscope or magnifying glass etc • identification of fibre • comparison of fibres ignore references to DNA analysis **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**6**	

Question			Answer	Marks	Guidance
6			D; B; D; A;	4	
			Total	**4**	

Question			Answer	Marks	Guidance
7			**Level 3 (5–6 marks)** Answer includes several relevant scientific points and some reference to calibration. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Answer includes some relevant scientific points. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Answer includes one or two relevant points. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to C** **relevant scientific points for L3 may include:** • test known concentrations • what data is collected • plot results from known concentrations • find unknown concentration • use graph to find concentration **relevant scientific points for L2 may include:** • set to zero • put sample in tube *in correct context* • measure light • reference to graph **relevant scientific points for L1 may include:** • some idea of what a colorimeter is • some idea of how it is used **Ignore** answers that do not relate to a colorimeter. **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**6**	

Question			Answer	Marks	Guidance
8	(a)		12/20 OR 6/10; 0.6	2	0.6 = 2 marks
	(b)	i	C;	1	
		ii	different dyes may have the same (Rf) values;	1	
			Total	**4**	
			Paper Total	**50**	

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