



...day June 20XX – Morning/Afternoon

GCSE (9–1) Combined Science (Biology) A (Gateway Science)

J250/07 Paper 7 (Higher Tier)

SAMPLE MARK SCHEME

Duration: 1 hour 10 minutes

MAXIMUM MARK 60

DRAFT

This document consists of 16 pages

MARKING INSTRUCTIONS**PREPARATION FOR MARKING****SCORIS**

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *scoris assessor Online Training*; *OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal <http://www.rm.com/support/ca>.
3. Log-in to scoris and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the scoris 50% and 100% (traditional 50% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the scoris messaging system.

5. Work crossed out:
 - a. where a candidate crosses out an answer and provides an alternative response, the crossed out response is not marked and gains no marks.
 - b. if a candidate crosses out an answer to a whole question and makes no second attempt, and if the inclusion of the answer does not cause a rubric infringement, the assessor should attempt to mark the crossed out answer and award marks appropriately.
6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.
7. There is a NR (No Response) option. Award NR (No Response)
 - if there is nothing written at all in the answer space
 - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
 - OR if there is a mark (e.g. a dash, a question mark) which isn't an attempt at the question.Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).
8. The scoris **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.** If you have any questions or comments for your Team Leader, use the phone, the scoris messaging system, or email.
9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:

Read through the whole answer from start to finish, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance. Using a 'best-fit' approach based on the skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer. Once the level is located, award the higher or lower mark:

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in italics) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in italics) are missing.

In summary:

The skills and science content determines the level.

The communication statement determines the mark within a level.

11. Annotations

Annotation	Meaning
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
()	Words which are not essential to gain credit
—	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

12. Subject-specific Marking Instructions

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

The breakdown of Assessment Objectives for GCSE (9–1) in Combined Science A (Gateway Science):

	Assessment Objective
AO1	Demonstrate knowledge and understanding of scientific ideas and scientific techniques and procedures.
AO1.1	Demonstrate knowledge and understanding of scientific ideas.
AO1.2	Demonstrate knowledge and understanding of scientific techniques and procedures.
AO2	Apply knowledge and understanding of scientific ideas and scientific enquiry, techniques and procedures.
AO2.1	Apply knowledge and understanding of scientific ideas.
AO2.2	Apply knowledge and understanding of scientific enquiry, techniques and procedures.
AO3	Analyse information and ideas to interpret and evaluate, make judgements and draw conclusions and develop and improve experimental procedures.
AO3.1	Analyse information and ideas to interpret and evaluate.
AO3.1a	Analyse information and ideas to interpret.
AO3.1b	Analyse information and ideas to evaluate.
AO3.2	Analyse information and ideas to make judgements and draw conclusions.
AO3.2a	Analyse information and ideas to make judgements.
AO3.2b	Analyse information and ideas to draw conclusions.
AO3.3	Analyse information and ideas to develop and improve experimental procedures.
AO3.3a	Analyse information and ideas to develop experimental procedures.
AO3.3b	Analyse information and ideas to improve experimental procedures.

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Mark Scheme

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SECTION A

Question	Answer	Marks	AO element	Guidance
1	B	1	1.1	
2	C	1	1.1	
3	C	1	2.1	
4	A	1	1.2	
5	D	1	2.1	
6	A	1	1.1	
7	A	1	2.1	
8	D	1	2.1	
9	A	1	2.2	
10	B	1	2.1	

SECTION B

Question		Answer	Marks	AO element	Guidance
11	(a)	chloroplast (1)	1	1.1	IGNORE cytoplasm
	(b)	increased resolution of EM ORA (1) greater detail seen / can see smaller objects more clearly (1)	2	1.2	ALLOW greater magnification
	(c)	6CO_2 (1) $\text{C}_6\text{H}_{12}\text{O}_6$ (1)	2	1.1	must be on correct side of equation
	(d) (i)	106 (1)	1	2.1	
	(ii)	suitable scale on correctly chosen axes (1) plotting accurate (1) suitable line of best fit (1)	3	2.2	DO NOT ALLOW scales that use less than half the graph ALLOW +/- half a square DO NOT ALLOW dot to dot line
	(iii)	increase in light intensity increases the rate of photosynthesis (1)	1	2.1	ALLOW the more light the more photosynthesis
	(iv)	source of error bubbles of differing size (1) miscounting bubbles (1) improvement collect volume of gas / use a measuring cylinder/gas syringe to collect gas (1) use a clicker / electronic device to count (1)	2	3.2a 3.3b	improvement must match the error

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Question		Answer	Marks	AO element	Guidance
12	(a)	1.0 cm ³ (1)	1	2.2	ALLOW 1 cm ³ ALLOW if written in the table
	(b)	control tube / to compare results to (1)	1	2.2	
	(c)	any two from: set up tubes in a water bath (1) use a Bunsen burner / electric heater for heat (1) use thermostat / Bunsen flame to maintain temperature (1)	2	2.2	
	(d)	drops are not an accurate measure of volume (1)	1	3.3a	IGNORE misreading volumes ALLOW difficult to maintain temperature if using a Bunsen flame to heat the water bath
	(e) (i)	colorimeter gives a real-time record throughout the 5 minutes/visual method is an end-point result AW (1) any two from: visual measure is subjective AW (1) colorimeter gives a quantitative measure AW (1) colorimeter will provide data that can be graphed ORA (1)	1 2	2.2 2 x 3.1a	
	(ii)	steepest slope to the graph / rate is approximately 130 lux per minute and faster than tube 1 at 100 lux per minute (1)	1	3.2b	
	(f)	enzyme has active site (1) active site shape is changed in extreme temperatures (1) so the active site will not fit the substrate (1) any two from: as it was boiled / heated to 100°C in Tube 4 (1) changed shape denatures the enzyme (1) irreversibly (1)	3 2	3 x 1.1 2 x 2.1	ALLOW description of active site ALLOW lock and key do not fit ALLOW lock and key labelled diagram

Question		Answer	Marks	AO element	Guidance
13	(a)*	<p>Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question.</p> <p>Level 3 (5–6 marks) Description of hormonal control and co-ordination and an explanation of the role of thyroxine in the body and an explanation of negative feedback.</p> <p><i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Level 2 (3–4 marks) Description of hormonal control and co-ordination and an explanation of the role of thyroxine in the body.</p> <p><i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p>Level 1 (1–2 marks) Description of the endocrine system and hormonal control and co-ordination.</p> <p><i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p>0 marks <i>No response or no response worthy of credit</i></p>	6	2 x 1.1 4 x 1.2	<p>AO1.2: Demonstrate knowledge of the negative feedback</p> <ul style="list-style-type: none"> Negative feedback controls the levels of thyroxine Negative feedback ensures that any changes are reversed and returned back to the normal level As levels of thyroxine increase in the bloodstream / TSH is inhibited this stops the thyroid gland producing thyroxine <p>AO1.1: Demonstrate knowledge of hormonal control particularly the role of thyroxine</p> <ul style="list-style-type: none"> Thyroxine controls cell metabolism Thyroxine ensures metabolism occurs at the correct pace Hormones are chemical messengers They are made in endocrine glands Transported around the body in the bloodstream

Question		Answer	Marks	AO element	Guidance
13	(b)	undifferentiated cells / cells that can develop into different cells, tissues and organs (1)	1	1.1	
	(c)	embryonic stem cells can become all cell types of the body / adult stem cells are thought to be limited to differentiating into different cell types of their tissue of origin (1)	1	1.1	ALLOW they are pluripotent.

SPECIMEN

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Question		Answer	Marks	AO element	Guidance
14	(a)	from the top clockwise: capillary, (artery), vein (2)	2	1.1	ALLOW plurals
	(b)	(i) volume for 4mm cube (4^3) = 64 (1) SA/V for 4mm cube = 1.5/1 (1)	2	2.1	
	(b)	(ii) capillaries (1) because the large network of tiny capillaries gives a large surface area to volume ratio ORA (1)	2	2.1	
	(c)	Any three from: total cross-sectional area is greatest in the capillaries / least in arteries and veins (1) as total cross-sectional area increases the velocity of the blood decreases / blood travels more slowly through the capillaries (1) arterial blood velocity is higher due to force of heart pump (1) the increased total cross-sectional area means the blood pressure reduces as blood passes through the capillaries (1)	3	3.1a	

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Question		Answer	Marks	AO element	Guidance							
15	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>stimulus</td> <td>receptor</td> <td>sensory neurone</td> <td>CNS</td> <td>motor neurone</td> <td>effector</td> <td>response</td> </tr> </table> <p style="text-align: right;">(2)</p>	stimulus	receptor	sensory neurone	CNS	motor neurone	effector	response	2	1.2	
stimulus	receptor	sensory neurone	CNS	motor neurone	effector	response						
	(b)	(i)										
		boys = 105 milliseconds (1)	2	2.2	ALLOW 104–106							
		girls = 200 milliseconds (1)			ALLOW 199–201							
	(b)	(ii)										
		control boy-boy / girl-girl pairs (1) opposite sex test e.g. boy-girl / girl-boy pairs (1)	3	3 x 3.3a								
		Any one from: similar sample sizes / similar aged groups (1) compare means for each group (1)			ALLOW same reaction room ALLOW compare reaction times for each group							