Rewarding Learning

General Certificate of Secondary Education
2023–2024

Single Award Science: Biology

Unit 1

Higher Tier

[GSA12]

WEDNESDAY 21 FEBRUARY 2024, MORNING

MARK SCHEME

General Marking Instructions

Introduction
Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives
Below are the assessment objectives for GCSE Single Award Science

Candidates must:

AO1 Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures;

AO2 Apply knowledge, skills and understanding of scientific ideas, scientific enquiry, techniques and procedures; and

AO3 Analyse information and ideas to interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.

Quality of candidates' responses
In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

Flexibility in marking
Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking
Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate.

Awarding zero marks
Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Marking Calculations
In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

Types of mark schemes
Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

				AVAILABLE MARKS
1	**(a)**	**(i)**	As the length of a hedgerow increases, the number of species of birds increases [1]	
		(ii)	Biodiversity will increase [1] because there are more habitats/food/shelter [1] [2]	
	(b)	**(i)**	The mass (of herring) had dropped to nearly zero [1]	
		(ii)	There was an increase in mass of herring numbers after quotas were introduced [1]	5
2	**(a)**		Any **two** from: • high blood glucose • glucose in the urine • lethargy • thirst [2]	
	(b)	**(i)**	Blood glucose levels are higher (throughout the day) [1] blood glucose levels fluctuate the most [1] [2]	
		(ii)	Have not eaten (breakfast) [1]	
		(iii)	40 ÷ 80 × 100 [1] 50% [1] [2]	
		(iv)	Carbohydrates/sugar [1]	8

		AVAILABLE MARKS
3	**(a)** Passed in droplets/coughs/sneezes [1] the further away people are the less chance that the droplets will reach another person [1] [2]	
	(b) **Indicative content** • in vitro • cells in the lab • to find out if the drug works • animal testing • on a complete organism/on an organism with an immune system • clinical testing • humans/volunteers • to find the dosage • to find out if there are side effects	

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe each test using **six or more** of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms throughout to describe each test using **four or five** of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe each test using **one, two or three** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and the form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 8

4	**(a)**	**(i)**	Iodine	[1]	
		(ii)	Blue-black	[1]	
	(b)	**(i)**	White chocolate makes it easier to see a colour change	[1]	
		(ii)	The food that changed the colour of the Benedict's first	[1]	4

					AVAILABLE MARKS
5	**(a)**	**(i)**	Phototropism	[1]	
		(ii)	Auxin	[1]	
		(iii)	More hormone on the shaded side [1] more cell elongation on the shaded side [1] shoot bends towards the light [1]	[3]	
		(iv)	Any **two** from: • more light • more photosynthesis • more growth	[2]	
	(b)		Middle arrow (pointing up) is circled	[1]	8
6	**(a)**	**(i)**	Dominant is always expressed/is expressed if heterozygous [1] recessive will be masked by the dominant/only expressed if homozygous [1]	[2]	
		(ii)			

	T	t
T	TT	Tt
t	Tt	tt

[1] gametes
[1] offspring [2]

		(iii)	25%	[1]	
		(iv)	Punnett (square)	[1]	
		(v)	3	[1]	
	(b)		Double helix	[1]	
	(c)	**(i)**	Amniocentesis	[1]	
		(ii)	Cystic Fibrosis	[1]	10

					AVAILABLE MARKS
7	**(a)**	**(i)**	Exothermic	[1]	
		(ii)	$C_6H_{12}O_6$ + $6O_2$ → $6H_2O$ + $6CO_2$ [1] [1] [1]	[3]	
	(b)	**(i)**	5 points correct [2] (4 points correct [1]) Straight line joining the points [1]	[3]	
		(ii)	As temperature increases the rate of respiration also increases [1] up to 40°C/14 arbitrary units then it decreases [1]	[2]	9
8	**(a)**		Any **three** from: • the mammals with one larger middle toe were better adapted (to the changing/drier/firmer ground) [1] • they survived • to reproduce • to pass on their genes to the next generation	[3]	
	(b)		(Theory of) Evolution	[1]	
	(c)		No living examples of the species remain	[1]	
	(d)		Fossils are the remains of living things preserved in rock [1] for millions of years/they can be dated [1] so they can be compared to each other/we can see the changes [1]	[3]	8
				Total	**60**