Rewarding Learning

General Certificate of Secondary Education
2025

Biology

Unit 3 Practical Skills

Booklet B

Foundation Tier

[GBL32]

THURSDAY 19 JUNE, 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.

Candidates must:

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

AO2 Apply knowledge 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.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

Levels of response
Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners.

- ***Threshold performance:*** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- ***Intermediate performance:*** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- ***High performance:*** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

Quality of written communication
Quality of written communication (QWC) is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form.

These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level A: Quality of written communication is excellent.
Level B: Quality of written communication is good.
Level C: Quality of written communication is basic.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

Level A (Excellent): The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation and spelling, punctuation and grammar (SPG) are of a sufficiently high standard to make meaning clear.

Level B (Good): The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation and spelling, punctuation and grammar (SPG) are sufficiently competent to make meaning clear.

Level C (Basic): The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation and spelling, punctuation and grammar (SPG) may be such that intended meaning is not clear.

Where one response is required to gain a mark, candidates will not gain credit if a correct response is given alongside one or more incorrect responses. This is referred to as listing.

AVAILABLE MARKS

1 **(a)** **(i)** A – (boiling) water;
B – ethanol; [2]

(ii) kill the leaf/stop chemical reactions in the leaf; [1]

(b) remove chlorophyll;
so colour change can be seen; [2]

(c) **(i)** turn off Bunsen burner/boil ethanol or liquid B in a water bath;
ethanol/liquid B is flammable; [2]

(ii) Any **two** from:
stop splashes to eyes; } wear goggles;
avoid cuts; } careful use of glassware;
irritation of skin; } careful use of iodine solution; [4] 11

2 **(a)** **(i)** wrist/neck; [1]

(ii) 121 – 76;
= 45; [2]

(b) Any **three** from:
highest heart rate at rest;
highest heart rate after exercise;
largest increase in heart rate
longest recovery time; [3]

(c) increased cardiac output/heart rate;
higher blood pressure; [2]

(d) Any **two** from:
increased breathing rate/increased depth of breathing;
strengthen muscles;
circulation/blood flows faster;
sweating;
loss weight; [2] 10

3 **(a)** **(i)** nutrients/water; [1]

(ii) autoclave; [1]

(b) **(i)** draught carries microorganisms in the air upwards;
prevents microorganisms entering the agar plate/contamination; [2]

					AVAILABLE MARKS
		(ii)	no bacterial growth/antibiotic killed bacteria;	[1]	
		(iii)	A; no clear area around disc; no bacteria killed;	[3]	8
4	**(a)**	**(i)**	measuring cylinder/syringe;	[1]	
		(ii)	water moves **into** Visking tubing/starch solution; by osmosis; dilute to concentrated solution/concentration gradient;	[3]	
		(iii)	Any **two** from: starch solution moves higher up capillary tube; volume of water in beaker decreases; starch solution moves faster;	[2]	
	(b)		Any **two** from: starch molecules too large; to pass through Visking tubing membrane into water; no starch in water;	[2]	8
5	**(a)**	**(i)**	quadrat;	[1]	
		(ii)	(line) transect;	[1]	
		(iii)	place tape measure along grassland and woodland; place quadrats/apparatus X along tape measure/line; every 2 metres; identify different species;	[4]	
	(b)	**(i)**	Grassland has more species; 15 decreases to 3;	[2]	
		(ii)	trees **shade** the light;	[1]	
		(iii)	less photosynthesis in woodland;	[1]	
	(c)		number of herbivores/disease; temperature/wind/water/soil pH; thermometer/anemometer/rain gauge/pH meter;	[3]	13
6	**(a)**	**(i)**	(5 ÷ 100) × 1.60; 0.08; 1.60 – 0.08 = 1.52; 1.5;	[4]	
		(ii)	percentage loss in mass calculated;	[1]	

				AVAILABLE MARKS
	(iii)	any **three** from: loss in mass due to loss in water; water is lost through stomata; Vaseline blocks stomata; fewer stomata on upper surface/more stomata on lower surface; (comparison needed for point 4)	[3]	
(b)	**(i)**	thickness of Vaseline/species of leaf;	[1]	
	(ii)	no Vaseline/Vaseline covering both surfaces;	[1]	10
7	**(a)** **(i)**	cell wall;	[1]	
	(ii)	controls cell activity;	[1]	

(b) Indicative content:

1. first view under low power/magnification
2. to view more cells/wider field of view/avoid damage to slide or lens/ locate the cells;
3. adjust light;
4. obtain clear image of cells;
5. move to/focus under medium power and/or **high** power;
6. to see more detail;

Band	Response	Mark
A	Candidates **must use appropriate, specialist terms** throughout to describe and explain their conclusions **using <u>at least 5</u> of the points**. 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 and explain their conclusions **using <u>at least 3</u> of the points**. They use **satisfactory** spelling, punctuation and grammar and the form and style are of a **satisfactory** standard.	[3]–[4]
C	Candidates make **little use of specialist terms** throughout to describe and explain their conclusions **using <u>at least 1</u> of the points**. The spelling, punctuation and grammar, form and style are of a **limited** standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

(c) **stain** the cells;
see the cells more clearly; [2] 10

Total **70**