



*Rewarding Learning*

**General Certificate of Secondary Education  
2019**

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**Biology**

Unit 3 Practical Skills

**Booklet B**

Higher Tier

**[GBL34]**

**MONDAY 17 JUNE, AFTERNOON**

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**MARK  
SCHEME**

## General Marking Instructions

### Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

### The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

- 1 (a) Water drawn in boiling tube; Thermometer drawn in water in boiling tube; [2]
- (b) 19; [1]
- (c)  $20 \times 34 \times 4.2$ ; 2856; [2]
- (d) (i) So that results could be **compared**/ Because they were **different masses** to begin with; [1]
- (ii) Any **two** from:  
 Food not completely burnt;  
 Energy lost to air/atmosphere/environment;  
 Heat loss to apparatus/described;  
 Water not mixed so temperature measured in cooler area; [2]
- (iii) (Higher) **sugar**/fat content (in chocolate biscuit); [1]

AVAILABLE  
MARKS

9

2 **Indicative content:**

1. Add 1 (3g) *egg/cube* (to each test tube);
2. Add protease;
3. *Leave for 5 minutes*;
4. *Weight/mass* of cube (lost);
5. *Volume* of protease;
6. Control temperature;

| Response  | Mark    |
|---|---------|
| Candidates <b>must use appropriate, specialist terms</b> throughout <b>using all the above points</b> . They use <b>good</b> spelling, punctuation and grammar and the form and style are of a <b>high standard</b> .                     | [5]–[6] |
| Candidates use <b>some appropriate, specialist terms</b> throughout <b>using three of the above points</b> . They use <b>satisfactory</b> spelling, punctuation and grammar and the form and style are of a <b>satisfactory</b> standard. | [3]–[4] |
| Candidates make <b>little use of specialist terms</b> throughout <b>using some or all of the above points</b> . The spelling, punctuation and grammar, form and style are of a <b>limited</b> standard.                                   | [1]–[2] |
| Response not worthy of credit   | [0]     |

[6]

6

- 3 (a) A – Objective lens;  
 B – Stage;  
 C – Light (source);  
 D – Focusing knob; [4]
- (b) (i) Nucleus; [1]
- (ii) Representative of photograph, e.g. 2 cells, shape;  
 Line style **and** correct size;  
**Nuclei** in size and position;  
 Double line visible to represent cell wall;  
 Cell wall labelled; [5]

|   |     |  | AVAILABLE MARKS |    |
|---|-----|--|-----------------|----|
|   | (c) | Place a thin section of onion/epidermis onto slide;<br>Stain with iodine/add water;<br>Place <b>coverslip</b> ;<br>Place at angle/slowly lower (onto onion epidermis);   | [4]             | 14 |
| 4 | (a) | Independent variable data in left-hand column;<br>Appropriate dependent variable column headings <i>and</i> sub headings;<br>Appropriate dependent variable units;<br><i>All</i> results as ordered;                       | [4]             |    |
|   | (b) | (i) The longer the exercise the higher the pulse rate;   | [1]             |    |
|   |     | (ii) A – lowest rate after 10s sprint;<br>A – 63 v 65;<br><b>or</b><br>A – heart rate increased by <i>less</i> ;<br>A – 63 to 82/by 19;  | [2]             |    |
|   | (c) | (i) Increase breathing <b>rate</b> ; increased <b>depth</b> of breathing   | [2]             |    |
|   |     | (ii) Sweat/increase blood pressure/increase body temperature;<br>Reduced risk of CHD (CVD/stroke/diabetes)/stronger muscles;   | [2]             | 11 |
| 5 | (a) | (i) 0.45;<br>Any <b>two</b> from:<br>Where the line (of best fit) crosses the x-axis;<br>No percentage loss in mass of cylinder/no net movement of water;<br>Concentration of solution equals concentration inside potato; | [3]             |    |
|   |     | (ii) <b>Description:</b> loss of mass;<br><b>Explanation:</b> potato (cells) lost <i>water</i> /cells plasmolysed/osmosis/<br>through selectively permeable membrane;<br>Dilute to concentrated solution;                  | [3]             |    |
|   |     | (iii) turgid;  | [1]             |    |
|   | (b) | (i) lysis;   | [1]             |    |
|   |     | (ii) Red blood cells have no cell wall but potato cells do;<br>Cell wall stops the cell expanding/bursting/limits the entry of water;  | [2]             | 10 |
| 6 | (a) | Any <b>three</b> from:<br>Chemical/antibiotic/penicillin <i>produced</i> by fungus;<br>Diffuses (through agar);<br>Kills bacteria/stops growth of bacteria;  | [3]             |    |
|   | (b) | Florey; Chain;   | [2]             | 5  |

|   |         |  |              |                        |
|---|---------|--|--------------|------------------------|
| 7 | (a) (i) | To prevent air bubbles (in water column/stem);   | [1]          | <b>AVAILABLE MARKS</b> |
|   | (ii)    | To reduce leaks/loss of water from apparatus;  | [1]          |                        |
|   | (b) (i) | Plastic bag; fan;  | [2]          |                        |
|   | (ii)    | Still air conditions, low humidity<br>(need <b>both</b> )  | [1]          |                        |
|   | (iii)   | Distance; time; replicates/repeats;  | [3]          |                        |
|   | (c)     | More air movement takes water molecules away;<br>Increase diffusion (gradient);<br>increase <i>evaporation</i> ; | [3]          |                        |
|   | (d) (i) | Slows down (rate of transpiration);  | [1]          |                        |
|   | (ii)    | Surface area/number of stomata;  | [1]          |                        |
|   | (e)     | Any <b>two</b> from:<br>Photosynthesis;<br>Turgor/support;<br>Cooling;<br>Transport;                             | [2]          |                        |
|   |         |  |              |                        |
|   |         |  | <b>Total</b> | <b>70</b>              |