



*Rewarding Learning*

**General Certificate of Secondary Education  
2014–2015**

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**Science: Single Award**

Unit 1 (Biology)

Foundation Tier

**[GSS11]**

**TUESDAY 24 FEBRUARY 2015, MORNING**

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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.

		AVAILABLE MARKS										
1	(a)	<table border="1"> <thead> <tr> <th>Type of microorganism</th> <th>Disease</th> </tr> </thead> <tbody> <tr> <td>fungi [1]</td> <td>athlete's foot</td> </tr> <tr> <td>virus</td> <td>flu [1]</td> </tr> <tr> <td>bacteria [1]</td> <td>chlamydia</td> </tr> </tbody> </table>	Type of microorganism	Disease	fungi [1]	athlete's foot	virus	flu [1]	bacteria [1]	chlamydia	[3]	5
	Type of microorganism	Disease										
	fungi [1]	athlete's foot										
	virus	flu [1]										
bacteria [1]	chlamydia											
(b)	Skin [1] trapped [1]	[2]										
2	(a)	All four bars correctly added [2] three bars correct [1]	[2]									
	(b)	Over time the human population increases	[1]									
	(c)	(i) No living members (of that species) remain	[1]									
	(ii) Nets with large mesh sizes [1] limits on the number of fishing boats [1]	[2]	6									
3	(a)	(i) Height <b>and</b> weight (both needed)	[1]									
	(ii) $2/5 \times 100$ [1] = 40% [1]	[2]										
	(b)	Long neck/pointed beak [1] explanation of description (e.g. long neck allows swans to reach river bed) [1]	[2]	5								
4	(a)	(i) Fungus kills/destroys bacteria (not just stops growth) [1] due to substance (antibiotic) spreading across Petri dish [1]	[2]									
	(ii) Fleming	[1]										
	(iii) Penicillin	[1]										
	(b)	(i) They contain very little carbohydrate/fat	[1]									
	(ii) Solvent/medium for chemical reactions	[1]	6									

			AVAILABLE MARKS										
5	(a)	(i) <b>A</b> – urethra [1] <b>B</b> – testis [1]	[2]	9									
		(ii) <b>X</b> on a sperm tube	[1]										
		(iii) Feeds sperm	[1]										
	(b)	(i) <b>Any two from:</b> <ul style="list-style-type: none"> <li>• traps sperm (leaving penis)/acts as a barrier</li> <li>• sperm cannot enter female</li> <li>• prevents fertilisation</li> </ul>	[2]										
		(ii) <b>Any three from:</b> <ul style="list-style-type: none"> <li>• condom not permanent/might want children later</li> <li>• not the most reliable but not an issue if pregnancy results</li> <li>• contraceptive pill can cause side effects/condoms have no side effects</li> <li>• sterilisation is permanent</li> </ul>	[3]										
6	(a)	(i) Antibodies are complementary shape to antigens [1] antibodies latch on to antigens/microorganisms [1] clumping/immobilisation [1]	[3]	9									
		(ii) Phagocyte/white blood cell surrounds/engulfs microorganism [1] microorganism is digested/broken down/destroyed/killed [1]	[2]										
		(b)	(i) Percentage of children vaccinated fell to around 45%/half after 1998 [1] from 2005 on the numbers vaccinated have risen to 90% [1]		[2]								
	(ii) Number of children vaccinated never reaches 100%	[1]											
	(c) Active	[1]											
	7	(a)	(i) DNA		[1]	7							
(ii) People with albinism do not have melanin/protection (against UV light) [1] are at increased risk of (skin) cancer [1]			[2]										
(b)			(i) <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td>A</td> <td>a</td> </tr> <tr> <td>A</td> <td>AA</td> <td>Aa</td> </tr> <tr> <td>a</td> <td>Aa</td> <td>aa</td> </tr> </table> <p style="margin-left: 20px;">Gametes [1] offspring [1]</p>		A		a	A	AA	Aa	a	Aa	aa
		A	a										
A		AA	Aa										
a		Aa	aa										
(ii) aa	[1]												
(iii) 75%/3 out of 4 children do not have albinism/3:1	[1]												

- 8 (a) (i) **A** – oxygen; **B** – carbon dioxide (both needed) [1]
- (ii) Respiration [1]
- (b) (i) 3.5 arbitrary units [1]  
maximum yield with minimum lighting (cost) [1] [2]
- (ii) More carbon dioxide/heat for photosynthesis/  
other appropriate response (e.g. no damaging effect of wind) [1]

9 (a) **Indicative content**

- number of pots each with different number of seedlings
- **any two** from: same type/volume compost/same water/same light/  
same temperature/left for same length of time/same size of pot/  
same type of seed
- (at end measure) mass/number of leaves/any suitable plant feature
- most growth would be in pots with fewest seedlings (or converse)
- due to reduced competition between plants (or converse)

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe how to investigate the effect of planting density on plant growth using <b>five or six</b> 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 to describe how to investigate the effect of planting density on plant growth using <b>three or four</b> 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 how to investigate the effect of planting density on plant growth using <b>one or two</b> of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

- (b) (i) Rhododendron/other appropriate example [1]
- (ii) Introduced by man/spread rapidly/outcompete native species [1]

**Total**

**AVAILABLE  
MARKS**

5

8

**60**