

**Advanced Subsidiary GCE**

## F213

**BIOLOGY**

Unit F213: Practical Skills in Biology 1  
Evaluative Task

**Specimen Task**

**For use from September 2008 to June 2009**

**All items required by teachers and candidates for this task are included in this pack.**

**INFORMATION FOR CANDIDATES**

- Practical Skills in Biology 1: Evaluative Task

**INFORMATION FOR TEACHERS**

- Mark scheme.
- Instructions for Teachers and Technicians.

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**Advanced Subsidiary GCE**

## F213

**BIOLOGY**

Unit F213: Practical Skills in Biology 1  
Evaluative Task

**Specimen Task**

**For use from September 2008 to June 2009.**

Candidates answer on this task sheet.



### INSTRUCTIONS TO CANDIDATES

- Answer **all** parts of the task.

### INFORMATION FOR CANDIDATES

- The total number of marks for this task is **20**.

### ADVICE TO CANDIDATES

- Read each part carefully and make sure you know what you have to do before starting your answer.

FOR TEACHER'S USE		
	Max.	Mark
TOTAL	20	

	Max.	Mark
TOTAL	20	

This task consists of **8** printed pages.

**Introduction**

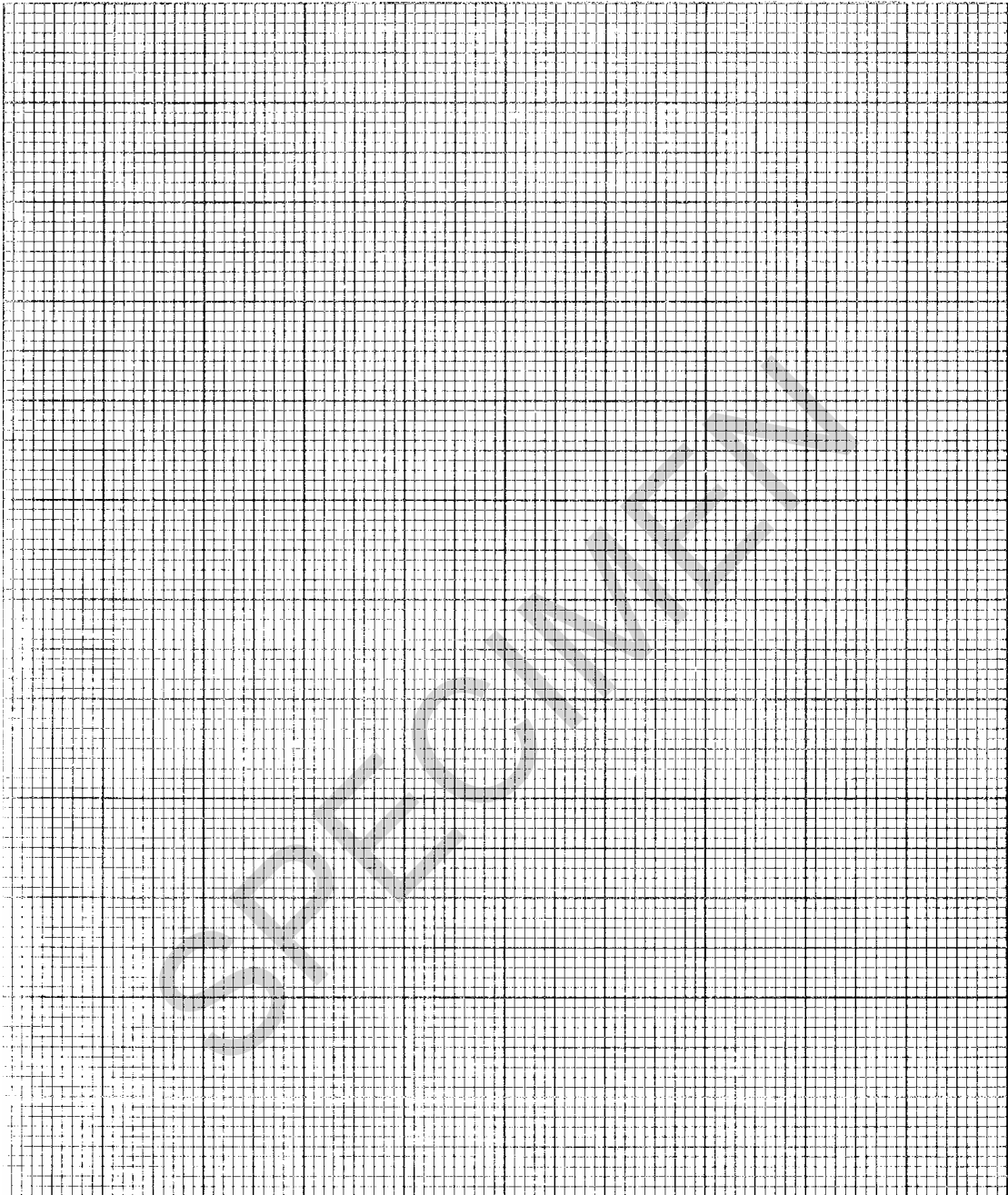
You collected data that can be used to investigate the effect of time since germination on the catalase activity of mung beans.

You have been supplied with raw data collected using the same data collection strategy you used in Quantitative Task 1.

- 1 (a) Process the raw data in the most suitable way and record it in the space below.

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- (b) Plot a suitable graph on the grid provided.



[Turn over

(c) Use your processed data and graph to describe the trend(s) in the processed data.

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(d) Outline the conclusions that can be made from the **processed** data.

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(e) Describe further processing that you could carry out on the data to give further support to your conclusions. (There is no need to carry out this processing but you should give details of how to do it.)

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(f) Explain the likely cause of the trend you described in part (c) **and** explain why there are differences in the catalase activity in the different groups of seedlings.

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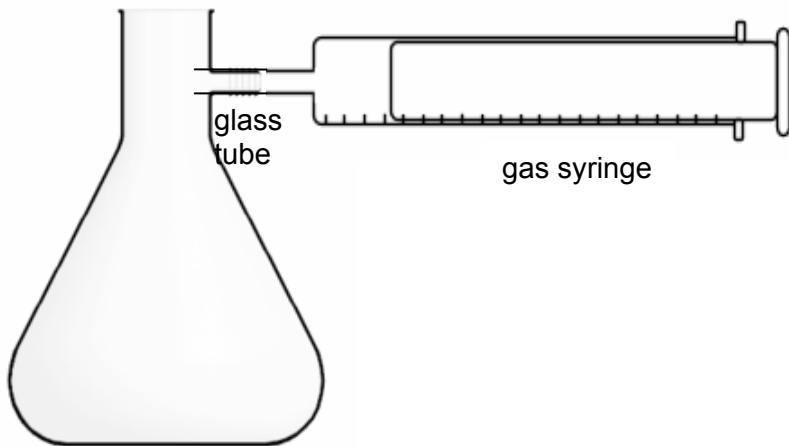
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- 2 The use of a side-arm conical flask, adapted with a fixed glass tube attached directly to a gas syringe would improve the reliability of the data collected in this experiment.



side-arm conical flask

- (a) Suggest how this alternative apparatus may improve the reliability of the data collection.

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- (b) State **three** possible limitations of the data collection strategy that you used and explain the effect of each limitation on the accuracy of the raw data you collected.

Limitation: .....

Effect: .....

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Limitation: .....

Effect: .....

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Limitation: .....

Effect: .....

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(c) Explain how you could modify and extend the data collection strategy you used to eliminate **one** of the sources of the limitations you describe above to generate more reliable data.

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3 Assess the validity of the conclusions that you have drawn using the raw data you have been presented with.

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**Total [20]**

**END OF TASK**

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**RAW DATA SHEET**  
**F213 Evaluative Task**  
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**Table 1**

Stage of germination (days)	replicate	Volume of oxygen collected (cm <sup>3</sup> )					
		1	2	3	4	5	6
0		10.0	10.5	5.0	9.5	9.0	10.6
2		30.5	31.0	32.5	37.0	41.5	39.0
4		67.5	79.0	67.5	59.0	68.0	76.1
6		31.0	32.5	42.0	41.5	39.0	35.4
10		18.5	25.0	30.0	21.0	24.5	25.5

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The maximum mark for this task is **20**.

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Question Number		Max Mark
<p><b>2(a)</b></p> <p><b>(b)</b></p> <p><b>(c)</b></p> <p><b>3</b></p>	<p>description of gas loss through connections leading to volume of gas being collected not being the volume actually generated ;</p> <p><i>any three from</i></p> <p>adding hydrogen peroxide onto seeds is slow <b>so</b> gas loss inevitable ;</p> <p>incomplete grinding of seeds <b>so</b> that not all catalase is released ;</p> <p>different samples of seed ground for different lengths of time <b>so</b> not all catalase released ;</p> <p>starting timer at same time as attaching bung difficult <b>so</b> ensuring reaction has run for thirty seconds is impossible ;</p> <p><i>any suitable improvement to limitation given in (c)</i></p> <p>e.g. use apparatus that allows hydrogen peroxide to be added after tubes are connected and sealed</p> <p>e.g. use mechanical grinder</p> <p><i>shows understanding of validity (accuracy + precision + reliability)</i></p> <p><i>credit up to three valid points</i></p> <p>are raw data points for each time close together?</p> <p>insufficient raw data collected</p> <p>data collected may be precise and reliable but not accurate due to losses of gas</p> <p>uncertainties about how the mung beans were prepared/stored before being germinated</p>	<p><b>1</b></p> <p><b>3</b></p> <p><b>1</b></p> <p><b>3</b></p>
<b>Total:</b>		<b>[20]</b>

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**`This task relates to Module 2, Unit F211. There is no time limit but it is expected that it can be completed within one timetabled lesson.**

It is assumed that you will have completed the teaching of the above module before setting your students this task. This module has links to other modules which contain related learning experiences – please refer to your specification.

Candidates may attempt more than one evaluative task with the best mark from this type of task being used to make up the overall mark for Unit F213.

### **Preparing for the assessment**

It is expected that before candidates attempt Practical Skills in Biology 1 (Unit F213) they will have had some general preparation in their lessons. They will be assessed on a number of qualities such as demonstration of skilful and safe practical techniques using suitable qualitative methods, the ability to make and record valid observations, and the ability to organise results suitably. It is therefore essential that they should have some advance practice in these areas so that they can maximise their attainment.

### **Preparing candidates**

At the start of the task the candidates should be given the task sheet.

Candidates must work on the task individually under controlled conditions with the completed task being submitted to the teacher at the end of the lesson. Completed tasks should be kept under secure conditions until results are issued by OCR.

Candidates should not be given the opportunity to redraft their work, as this is likely to require an input of specific advice. If a teacher feels that a candidate has under-performed, the candidate may be given an alternative task. In such cases it is essential that the candidate be given detailed feedback on the completed assessment before undertaking another task of this type. Candidates are permitted to take each task **once** only.

### **Assessing the candidate's work**

The mark scheme supplied with this pack should be used to determine a candidate's mark out of a total of 20 marks. The cover sheet for the task contains a grid for ease of recording marks. To aid moderators it is preferable that teachers mark work using red ink, including any appropriate annotations to support the award of marks.

### **Notes to assist teachers with this task**

Teachers must trial the task before candidates are given it, to ensure that the apparatus, materials, chemicals etc provided by the centre are appropriate. The teacher carrying out the trial must complete a candidate's task sheet showing the results attained, and retain this, clearly labelled, so that it can be provided to the moderator when requested.

### **Health and Safety**

Attention is drawn to Appendix E of the specification.

**Technicians' list**

Collect data from five or more students who have carried out the above experiment.

Include a sixth set of data that contains two clear anomalous pieces of data.

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