

# Specification

## For international centres only

GCE Biology

**Edexcel Advanced Subsidiary GCE in Biology (8BI07)**

First examination 2009

**Edexcel Advanced GCE in Biology (9BI07)**

First examination 2010

**International Alternative to Internal Assessment**

(Units 3B and 6B)

January 2008



# Edexcel GCE in Biology (8BI07/9BI07)

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AS	Unit 3B: Practical Biology and Research Skills	Unit code 6BI07	
	<ul style="list-style-type: none"><li>Externally assessed</li><li>Availability: January and June</li><li>First assessment: January 2009</li></ul>	20% of the total AS marks	10% of the total GCE marks
<b>Content summary:</b> <p>Students are expected to develop experimental skills, and a knowledge and understanding of experimental techniques, by carrying out a range of practical experiments and investigations while they study Units 1 and 2.</p> <p>This unit will assess students' knowledge and understanding of experimental procedures and techniques that were developed when they did those experiments.</p>			
<b>Assessment:</b> <p>Assessment for this unit consists of one externally assessed written examination paper of 1 hour 30 minutes' duration.</p>			

A2	Unit 6B: Practical Biology and Investigative Skills	Unit code 6BI08	
	<ul style="list-style-type: none"><li>Externally assessed</li><li>Availability: January and June</li><li>First assessment: January 2010</li></ul>	20% of the total A2 marks	10% of the total GCE marks
<b>Content summary:</b> <p>Students are expected to develop a wide knowledge and understanding of experimental procedures and techniques throughout the whole of their Advanced Level course. They are expected to become aware of how these techniques might be used to investigate interesting biological questions.</p> <p>This unit will assess students' knowledge and understanding of experimental procedures and techniques and their ability to plan whole investigations, analyse data and to evaluate their results and experimental methodology.</p>			
<b>Assessment:</b> <p>Assessment for this unit consists of one externally assessed written examination paper of 1 hour 30 minutes' duration.</p>			



### 3.1 Unit description

<b>Introduction</b>	<p>Students are expected to develop experimental skills, and a knowledge and understanding of experimental techniques, by carrying out a range of practical experiments and investigations covered in Units 1 and 2.</p> <p>This unit will assess students' knowledge and understanding of experimental procedures and techniques that were developed when they did those experiments.</p>
<b>Development of practical skills, knowledge and understanding</b>	<p>Students should do a variety of practical work during the AS course to develop their practical skills. This should help them to gain an understanding and knowledge of the practical techniques that are used in experimental work.</p> <p>Centres should provide opportunities for students to plan experiments, implement their plans, collect data, analyse their data and draw conclusions to prepare them for the assessment of this unit.</p> <p>Experiments should cover a range of different topic areas and require the use of a variety of practical techniques.</p>
<b>How Science Works</b>	<p>The QCA GCE Science criteria include <i>How Science Works</i> (see page 12 of the main specification). Students should be given the opportunity to develop their practical skills for <i>How Science Works</i>, numbers 2-6, as detailed on page 12 of the main specification, by completing a range of different experiments that require a variety of different practical techniques.</p> <p>Students should produce laboratory reports on their experimental work using appropriate scientific, technical and mathematical language, conventions and symbols in order to meet the requirements of <i>How Science Works</i> number 8.</p>

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### 3.2 Assessment information

<b>Examination paper</b>	<p>This unit is assessed by means of a written examination paper of 1 hour 30 minutes' duration. Students may be required to apply their knowledge and understanding of biology to situations that they have not seen before.</p> <p>The total number of marks available for this examination paper is 40. It contributes 10 per cent to the Advanced GCE in Biology.</p>
<b>Materials required</b>	<p>Students will need a calculator, an HB pencil and a ruler for this paper.</p>

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### 3.3 Assessment details

		Marks
Question 1	This question will be based on an area of one (or more) of the specified core practicals, but will generally be set in a novel situation. Students will be expected to apply familiar core practical techniques to answer this question successfully.	20
Question 2	<p>A partially complete visit/issue report will be provided. Students will be required to comment on material already in the report and to suggest improvements or/and additions. Ten minutes reading time is built in.</p> <p>The overall aim is to assess a candidate's ability to understand how to produce such a report as described in the criteria on page 80 of the specification.</p>	20

### 3.1 Unit description

<b>Introduction</b>	<p>Students are expected to develop a wide knowledge and understanding of experimental procedures and techniques throughout the whole of their Advanced Level course. They are expected to become aware of how these techniques might be used to investigate interesting biological questions.</p> <p>This unit will assess students' knowledge and understanding of experimental procedures and techniques and their ability to plan whole investigations, analyse data and to evaluate their results and experimental methodology.</p>
<b>Development of practical skills, knowledge and understanding</b>	<p>Students should undertake a variety of practical work and investigations during the AS and A2 course to develop their practical skills and extend their knowledge of useful procedures and techniques.</p> <p>To prepare students effectively for this paper it is essential that centres provide opportunities for students to plan investigations, implement their plans, collect data, analyse their data, draw conclusions and evaluate their findings. It will be helpful to students for centres to approach the practical procedures and techniques named in the specification in the context of simple investigations rather than as isolated skills.</p>
<b>How Science Works</b>	<p><i>How Science Works</i> is a major underlying theme for the whole GCE examination. This assessment is designed to test criteria 2-6 of this theme. Full details are given on page 12 of the main specification.</p>

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### 3.2 Assessment information

<b>Examination paper</b>	<p>This unit is assessed by means of a written examination paper of 1 hour 30 minutes' duration. The paper will contain three questions. Students may be required to apply their knowledge and understanding of biology from both the AS and A2 units in planning a complete investigation in some detail.</p> <p>The total number of marks available for this examination paper is 50. It contributes 10 per cent to the Advanced GCE in Biology.</p> <p>The examiners will use the <i>How Science Works</i> criteria and the criteria for the individual investigation when compiling this paper.</p>
<b>Materials required</b>	<p>Students will need a calculator, an HB pencil and a ruler for this paper.</p>

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### 3.3 Assessment details

Question number		Approximate mark allocation
<b>Question 1</b>	<p>This question will test students' knowledge and understanding of the experimental principles and applications of the practical work they have undertaken in Units 1, 2, 4 and 5.</p> <p>Students will be expected to be able to:</p> <ul style="list-style-type: none"><li>(i) show a clear understanding of the underlying principles of the experimental procedures and techniques they have used</li><li>(ii) be aware of the advantages and limitations of the experimental procedures and techniques they have used</li><li>(iii) give an account of practical details which illustrate their familiarity with the experimental procedures and techniques listed in the AS and A2 specifications</li><li>(iv) explain how the experimental procedures and techniques with which they are familiar might be used to investigate a suggested hypothesis</li><li>(v) use biological knowledge and understanding to explain and justify a hypothesis which might be tested by using familiar procedures and techniques.</li></ul>	12
<b>Question 2</b>	<p>This question will test students' ability to tabulate and manipulate raw data and to recognise anomalous results and explain how they may be dealt with appropriately. They will be expected to be able to suggest suitable statistical tests and interpret their results.</p> <p>Students will be expected to:</p> <ul style="list-style-type: none"><li>(i) format tables for data using clear titles, appropriate significant figures and SI units where appropriate</li><li>(ii) distinguish between anomalous results and small experimental variations, and take account of the differences in manipulating the data</li><li>(iii) select appropriate methods of manipulating data to aid the analysis of a stated hypothesis and carry out simple calculations</li><li>(iv) select and draw an appropriate graphical representation of data</li><li>(v) name and interpret appropriate statistical tests for significant differences between means and medians, correlations and associations by demonstrating an understanding of the application of a null hypothesis and 95 per cent confidence limits.</li></ul>	15



Question number		Approximate mark allocation
<b>Question 3</b>	<p>This question will test students' ability to plan a safe scientific investigation, suggest ways in which the data collected might be analysed and evaluate the limitations of their planned methodology.</p> <p>Students will be expected to:</p> <ul style="list-style-type: none"> <li>(i) explain reasons for their choice of apparatus and techniques</li> <li>(ii) assess the main risks associated with their planned approach and suggest ways of minimising these risks</li> <li>(iii) suggest suitable preliminary investigations which would help them decide on final method details</li> <li>(iv) describe their planned method in sufficient detail to explain how all important variables are to be controlled and the type and range of data they intend to collect</li> <li>(v) describe suitable means of data analysis which are carefully matched to the suggested hypothesis and methodology</li> <li>(vi) demonstrate an awareness of the limitations of their suggested approach.</li> </ul>	23

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#### Acknowledgements

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