

Please read the instructions printed at the end of this form. **One** of these sheets, suitably completed, should be attached to the assessed work of **each** candidate.

Unit Title	15 Application of Biotechnology				Unit Code	G634	Session	Jan / June	Year	2	0	0
Centre Name								Centre Number				
Candidate Name								Candidate Number				
Evidence of your investigation into the use of biotechnology to solve agricultural, medical and industrial problems.												
Criteria								Teacher Comment				Page No.
<b>AO1(a).1:</b> You will produce a clearly presented booklet about the science of genetic engineering;  [0 1 2]	<b>AO1(a).2:</b> You will produce a researched, detailed booklet about the science of genetic engineering with relevant information selected that is clearly and logically presented;  [3]	<b>AO1(a).3:</b> You will produce a booklet about the science of genetic engineering, based on thorough research, with evidence that relevant information has been selected from a variety of sources, that is clearly and logically presented.  [4 5]					Mark					
<b>AO1(b).1:</b> You will produce a clearly presented booklet about the use of recombinant DNA technology in medicine or agriculture;  [0 1 2]	<b>AO1(b).2:</b> You will produce a researched, detailed booklet about the use of recombinant DNA technology in medicine or agriculture with relevant information selected that is clearly and logically presented;  [3]	<b>AO1(b).3:</b> You will produce a booklet about the use of recombinant DNA technology in medicine or agriculture, based on thorough research, with evidence that relevant information has been selected from a variety of sources, that is clearly and logically presented.  [4 5]					Mark					
<b>AO2(a).1:</b> You will describe how successful recombinant DNA technology is in solving problems associated with food production by crop plants and come to a simple conclusion on the overall benefits of the technology;  [0 1 2]	<b>AO2(a).2:</b> You will describe how successful recombinant DNA technology is in solving problems associated with food production by crop plants and come to a conclusion based on clear evidence; some evidence of evaluation of at least two specific examples of the technology is needed;  [3]	<b>AO2(a).3:</b> You will produce a comprehensive evaluation of the success of specific examples of the production of genetically modified plants; there will be clearly referenced evidence for your case and a summary of your main findings.  [4 5]					Mark					
<b>AO2(b).1:</b> You will present some financial, statistical evidence involving basic calculations;  [0 1]	<b>AO2(b).2:</b> You will present detailed financial, statistical analysis including calculations;  [2]	<b>AO2(b).3:</b> You will present financial evidence with appropriate complex calculations.  [3]					Mark					

Criteria			Teacher Comments	Page No.
<b>AO2(c).1:</b> You will carry out a simple analysis of the moral and ethical case for one aspect of using recombinant DNA technology in the production of GM plants and explain one of the controls placed on scientists working in this field, using some relevant evidence; [0 1 2]	<b>AO2(c).2:</b> You will summarise some of the moral, ethical and environmental issues concerning the use of recombinant DNA technology in the production of GM plants; you will need to explain two types of controls placed on scientists that work in this field; [3 4]	<b>AO2(c).3:</b> You will explain fluently what you consider to be the main moral, ethical and environmental issues concerning the use of recombinant DNA technology in the production of GM plants; you will need to evaluate two types of controls placed on scientists that work in this field for how effective they are. [5 6]	Mark	
<b>AO3(a).1:</b> You will plan your practical work with help, including risk assessments; you will construct a simple reactor and be able to produce and use an immobilised enzyme; [0 1 2]	<b>AO3(a).2:</b> You will produce a clear plan with limited help which includes risk assessments consistent with COSHH guidelines; [3]	<b>AO3(c).3:</b> You will produce a clear plan of action of your own, including detailed risk assessments consistent with COSHH guidelines, using secondary sources. [4 5]	Mark	
<b>AO3(b).1:</b> You will carry out measurements from the reactor, with help; you will use a range of techniques and equipment; [0 1 2]	<b>AO3(b).2:</b> You will carry out measurements from the constructed bioreactor using an immobilised enzyme system; you will use a range of techniques and equipment and have repeated measurements, working with an appropriate degree of accuracy; [3]	<b>AO3(b).3:</b> You will carry out measurements from the constructed bioreactor, using an immobilised enzyme system, on factors affecting your bioreactor; you will explain the use of a range of techniques and equipment and will have repeated measurements when appropriate; you will work with an appropriate degree of accuracy. [4 5]	Mark	
<b>AO3(c).1:</b> You will make and record relevant observations and measurements on the effect of temperature on the constructed bioreactor, with help; you will display the data obtained using tables and simple graphs, with help; [0 1 2 3]	<b>AO3(c).2:</b> You will make and record relevant observations and measurements on both the bioreactor and the immobilised enzymes, using precision in your measurements; you will display the scientific data accurately in a range of ways including some simple calculations on rates of reaction; [4 5 6 7]	<b>AO3(c).3:</b> You will make and record a detailed set of relevant observations with limited help, using the appropriate precision in your measurements; you will display the scientific data accurately in a range of ways, and process them in a manner chosen to best illustrate the trends in data; you will collect sufficient data to complete simple statistics on the results. [8 9]	Mark	
<b>AO3(d).1:</b> You will give some interpretation of the results and relate these to how enzymes work and enzyme immobilisation; [0 1 2]	<b>AO3(d).2:</b> You will interpret the results and draw basic conclusions relating your results to how enzymes work, the advantages of using bioreactors and enzyme immobilisation; [3 4 5]	<b>AO3(d).3:</b> You will interpret the results in detail using secondary sources to support your findings; you will draw conclusions relating your results to the use of bioreactors and enzyme immobilisation, specifying named examples in either medicine or industry; you will discuss the significance of your findings in terms of how enzymes work and the advantage of enzyme technology to industry. [6 7]	Mark	
<b>Total/50</b>				
If this work is a re-sit, please tick	Session and Year of previous submission	Jan / June	2 0 0	Please tick to indicate this work has been standardised internally

Please note: This form may be updated on an annual basis. The current version of this form will be available on the OCR website ([www.ocr.org.uk](http://www.ocr.org.uk)).  
A completed Centre Authentication form CCS160 **must** accompany the MS1 when it is sent to the moderator.

### Guidance on Completion of this Form

- 1 One sheet should be used for each candidate.
- 2 Please ensure that the appropriate boxes at the top of the form are completed.
- 3 Please enter *specific* page numbers where evidence can be found in the portfolio, and where possible, indicate to which part of the text in the mark band the evidence relates.
- 4 Circle the mark awarded for each strand of the marking criteria in the appropriate box and also enter the circled mark in the final column.
- 5 Add the marks for the strands together to give a total out of 50. Enter this total in the relevant box.