

Our ref: MH/TH

23 August 2004

To:
The Person Responsible for Biotechnology
SQA Co-ordinators
Directors of Education
Biology Assessment Panel Members
Customer Accounts Managers

Action by Recipient	
	Response required
✓	Note and pass on
	None – update/information only

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Dear Colleague

National Qualifications Update – Biotechnology

This letter is intended to provide centres with an update on National Qualifications and should be passed to the member of staff responsible for Biotechnology.

1 Summary of Changes made to the Arrangements documents

The Fifth edition of the Arrangements documents were published in March 2004. Summaries of the changes made to the Intermediate 2 and Higher Biotechnology courses to reduce the internal assessment load are attached in Appendices A and B.

The Arrangements documents have been issued to centres on CD-ROM and are available on the NQ Biotechnology section of the non-secure part of the SQA website.

2 NABS

In light of the changes made to the Arrangements documents to reduce the internal assessment load, the NABS have also been amended. A summary of the NABS that are due to be published is attached in Appendix C.

I hope the contents of this letter are helpful to you. Please do not hesitate to contact me if you need further clarification.

Yours faithfully

A handwritten signature in black ink that reads "Mary Hoey". The signature is written in a cursive style with a large, looping 'M' and 'H'.

Mary Hoey
Qualifications Manager
NQ Maths, Science and Language Team

Biotechnology Subject Update Letter (August 2004)

INTERMEDIATE 2 BIOTECHNOLOGY ARRANGEMENTS DOCUMENT (FIFTH EDITION – published March 2004)

Summary of Changes

The changes made to the Arrangements document are indicated by the text underlined below.

Note of Changes to Arrangements

Course Details

Details of the Instruments for Internal Assessment

Unit: The Biology of Micro-organisms (Intermediate 2)

Outcome 3 section reworded as follows:

A report of a problem solving activity related to Intermediate 2 Biotechnology is required covering all the performance criteria set out in the unit specification.

Candidates are required to produce only one report on a problem solving activity for Intermediate 2 Biotechnology. This report can be used as evidence for Outcome 3 in ‘The Biology of Micro-organisms’ and for Outcome 2 in ‘Biotechnology Processes’.

Unit: Biotechnology Processes (Intermediate 2)

Outcome 2 section reworded as:

A report of one problem solving activity related to Intermediate 2 Biotechnology is required, covering all the performance criteria set out in the unit specification.

Candidates are required to produce only one report on a problem solving activity for Intermediate 2 Biotechnology. This report can be used as evidence for Outcome 3 in ‘The Biology of Micro-organisms’ and for Outcome 2 in ‘Biotechnology Processes’.

National Unit Specification:

D038 11 The Biology of Micro-organisms

Statement of Standards

Outcome 3: outcome, performance criteria and evidence requirements have been amended.

Outcome 3 reworded as:

3 Solve problems related to Intermediate 2 Biotechnology.

Performance criteria

- (a) The problem to be solved is identified.
- (b) Resources required to solve the problem are identified and obtained.
- (c) Procedures appropriate to solving the problem are planned and designed.
- (d) The planned procedures are carried out.
- (e) The problem solving procedure is evaluated.

Evidence requirements

A report of one problem solving activity covering the above performance criteria in relation to the contents and notes specified for Intermediate 2 Biotechnology. The report must be the individual work of the candidate. Depending on the activity, the problem solving may be groupwork.

Support Notes

Revised guidance on Outcome 3 is given:

This involves the submission of one report of a problem solving activity related to Intermediate 2 Biotechnology.

Candidates are only required to produce one report on a problem solving activity for Intermediate 2 Biotechnology. This report can be used as evidence for Outcome 3 in ‘The Biology of Micro-organisms’ and for Outcome 2 in ‘Biotechnology Processes’.

The ‘Outcome 3: Teacher/lecturer guide’ is provided to indicate what might be addressed to achieve a specific performance criterion. The relevance of the items will vary according to the problem solving activity being undertaken eg bullet points which refer to variables would not apply in a case study type problem solving activity. The professional judgement of the teacher/lecturer will be important in deciding if a performance criterion has been met for a particular activity.

Outcome 3: Teacher/Lecturer guide

All the performance criteria given in the left-hand column must be achieved in order to attain the outcome. The right-hand column gives suggestions which might aid the professional judgement of the assessor.

Performance criteria	Suggestions to aid professional judgement
(a) The problem to be solved is identified.	Main features of the problem are identified.

(b) Resources required to solve the problem are identified and obtained.	Resources might include: <ul style="list-style-type: none"> • sources of information • set procedures • people • equipment/physical resources • materials.
(c) Procedures appropriate to solving the problem are planned and designed.	The plan might include: <ul style="list-style-type: none"> • what is to be measured/collected • variable altered • variable kept constant • how many readings/measurements/observations/subjects • equipment/resources required • how data will be recorded, analysed, presented.
(d) The planned procedures are carried out.	This would include a record of the data collected, analysis and presentation of data. Data should be analysed and presented in tabular, graphical format or as a scatter diagram or equivalent as appropriate: <ul style="list-style-type: none"> • for tabular presentation this must include: suitable heading and units showing averages or other appropriate computations • for graphical presentation this must include: data presented as a histogram, bar chart, connected points, line of best fit as appropriate, with suitable scales and axes labelled with quantities and units and with data correctly plotted.
(e) The problem solving procedure is evaluated.	The evaluation might include: <ul style="list-style-type: none"> • an assessment of the effectiveness of the procedure including: planning and organising the outcome of the activity • drawing valid conclusions, which make use of the presented evidence • suggestions for alternative or modified strategies, further work, predictions or generalisations • an assessment/explanation of the relevance of the results.

D039 11 Working with Micro-organisms

Statement of Standards

No change

Support Notes

No change

D040 11 Biotechnology Processes

Statement of Standards

Outcome 2: outcome and evidence requirements have been amended.

2 Solve problems related to Intermediate 2 Biotechnology.

Performance criteria have not been changed.

Evidence requirements now read:

A report of one problem solving activity related to Intermediate 2 Biotechnology covering the above performance criteria in relation to the content and notes specified for Intermediate 2 Biotechnology. The report must be the individual work of the candidate. Depending on the activity, the problem solving may be groupwork.

Support Notes

Guidance on Approaches to Assessment for this unit

Additional advice is given for Outcome 2. Now reads:

This involves the submission of one report of a problem solving activity related to Intermediate 2 Biotechnology.

Candidates are only required to produce one report on a problem solving activity for Intermediate 2 Biotechnology. This report can be used as evidence for Outcome 3 in 'The Biology of Micro-organisms' and for Outcome 2 in 'Biotechnology Processes'.

Biotechnology Subject Update Letter (August 2004)

HIGHER BIOTECHNOLOGY ARRANGEMENTS DOCUMENT (FIFTH EDITION – published March 2004)

Summary of Changes

The changes made to the Arrangements document are indicated by the text underlined below.

Note of Changes to Arrangements

Course Details

Assessment: section inserted which clarifies details of the Instruments for Internal Assessment.

Unit: Microbiology

Outcome 3 now reads:

A report of a problem solving activity related to Higher Biotechnology is required covering all the performance criteria set out in the unit specification.

Candidates are required to produce only one report on a problem solving activity for Higher Biotechnology. This report can be used as evidence for Outcome 3 in ‘Microbiology’ and for Outcome 2 in ‘Biotechnology’.

Unit: Biotechnology

Outcome 2 now reads:

A report of one problem solving activity related to Higher Biotechnology is required covering all the performance criteria set out in the unit specification.

Candidates are required to produce only one report on a problem solving activity for Higher Biotechnology. This report can be used as evidence for Outcome 3 in ‘Microbiology’ and for Outcome 2 in ‘Biotechnology’.

National Unit Specification

D038 12 Microbiology

Statement of Standards

Outcome 3: outcome, performance criteria and evidence requirements have been amended.

3 Solve problems related to Higher Biotechnology.

- (a) The problem to be solved is identified.
- (b) Resources required to solve the problem are identified and obtained.
- (c) Procedures appropriate or solving the problem are planned and designed.
- (d) The planned procedures are carried out.
- (e) The problem solving procedure is evaluated.

Evidence requirements now read

A report of one problem solving activity covering the above performance criteria in relation to the content and notes specified for Higher Biotechnology. The report must be the individual work of the candidate. Depending on the activity, the problem solving may be groupwork.

Support Notes

Revised guidance on Outcome 3 is given. Now reads:

This involves the submission of one report of a problem solving activity related to Higher Biotechnology.

Candidates are only required to produce one report on a problem solving activity for Higher Biotechnology. This report can be used as evidence for Outcome 3 in ‘Microbiology’ and for Outcome 2 in ‘Biotechnology’.

The ‘Outcome 3: Teacher/lecturer guide’ is provided to indicate what might be addressed to achieve a specific performance criterion. The relevance of the items will vary according to the problem solving activity being undertaken eg bullet points which refer to variables would not apply in a case study type problem solving activity. The professional judgement of the teacher/lecturer will be important in deciding if a performance criterion has been met for a particular activity.

All the performance criteria given in the left-hand column must be achieved in order to attain the outcome. The right-hand column gives suggestions which might aid the professional judgement of the assessor.

Performance criteria	Suggestions to aid professional judgement
(a) The problem to be solved is identified.	Main features of the problem are identified.
(b) Resources required to solve the problem are identified and obtained.	Resources might include: <ul style="list-style-type: none">• sources of information• set procedures• people• equipment/physical resources• materials.

<p>(c) Procedures appropriate to solving the problem are planned and designed.</p>	<p>The plan might include:</p> <ul style="list-style-type: none"> • what is to be measured/collected • variable altered • variable kept constant • how many readings/measurements/observations/subjects • equipment/resources required • how data will be recorded, analysed and presented.
<p>(d) The planned procedures are carried out.</p>	<p>This would include a record of the data collected, analysis and presentation of data.</p> <p>Data should be analysed and presented in tabular, graphical format or as a scatter diagram or equivalent as appropriate:</p> <ul style="list-style-type: none"> • for tabular presentation this must include: suitable headings and units showing averages or other appropriate computations. • for graphical presentation this must include: data presented as a histogram, bar chart, connected points, line of best fit as appropriate, with suitable scales and axes labelled with quantities and units and with data correctly plotted.
<p>(e) The problem solving procedure is evaluated.</p>	<p>The evaluation might include:</p> <ul style="list-style-type: none"> • an assessment of the effectiveness of the procedure including: planning and organising and the outcome of the activity • drawing valid conclusions, which make use of the presented evidence • suggestions for alternative or modified strategies, further work, predictions or generalisations • an assessment/explanation of the relevance of the results.

D039 12 Microbiological Techniques

Statement of Standards

No change

Support Notes

No change

D040 12 Biotechnology

Statement of Standards

Outcome 2: outcome and evidence requirements have been amended.

2 Solve problems related to Higher Biotechnology.

No changes made to performance criteria.

Evidence requirements now read:

A report of one problem solving activity related to Higher Biotechnology covering the above performance criteria in relation to the content and notes specified for Higher Biotechnology. The report must be the individual work of the candidate. Depending on the activity, the problem solving may be group work.

Support Notes

Additional guidance is given on the content and context for this unit.

Guidance on Approaches to Assessment for this unit:

Additional advice is given for Outcome 2.

Now reads:

This involves the submission of one report of a problem solving activity related to Higher Biotechnology.

Candidates are only required to produce one report on a problem solving activity for Higher Biotechnology. This report can be used as evidence for Outcome 3 in 'Microbiology' and for Outcome 2 'Biotechnology'.

Appendix C

Biotechnology Subject Update Letter (August 2004)

NAB Ref	Title	NAB	Expected Publication Date
D038 11/NAB 001	The Biology of Micro-organisms	Replaces NAB issued August 1999 and revised information	August 2004
D040 11/NAB 001	Biotechnology Processes	Replaces NAB issued January 2003	August 2004
D035 12/NAB 001	Biotechnology	Replaces NAB issued February 2000 and revised info issued 2002	August 2004
D041 12/NAB 001	Microbiology	Replaces NAB issued October 1999 and revised information issued 2002	August 2004