

Principal Assessor Report 2002

Assessment Panel:

Biology

Qualification area

**Subject(s) and Level(s)
included in this report**

Biology – Higher Level

Statistical information: update

Number of entries in 2001	
Pre appeal	8939
Post appeal	9380

Number of entries in 2002	
Pre appeal	9309
Post appeal	

General comments re entry numbers

Entry numbers are equivalent to those of 2001.

Two of the factors that may account for this are:

1. The present demographic trend
2. Candidates taking up an Intermediate 2 course rather than entering for the Higher Level.

General comments

The overall impression from Marker's Reports and Setters was that this year's population showed great similarities to that of 2001.

This was supported by the shape of the curve for Mark Distribution. The curve was very similar to that obtained in 2001.

Grade boundaries at C, B and A for each subject area included in the report

Maximum mark = 130

Grade boundaries expressed as percentage of mark in brackets

Year	Upper A	A	B	C
2002	110 (84.6%)	98 (75.4%)	80 (61.5%)	63 (48.5%)

General commentary on grade boundaries

Notional percentage cut-offs for each grade

Question papers and their associated marking schemes are designed to be of the required standard and to meet the assessment specification for the subject/level concerned.

For National courses the examination paper(s) are set in order that a score of approximately 50% of the total marks for all components merits a grade C (based on the grade descriptions for that grade), and similarly a score of 70 % for a grade A. The lowest mark for a grade B is set by the computer software as half way between the C and A grade boundaries.

Comments on grade boundaries for each subject area

Both the overall standard of the examination and that of the candidates were viewed as being very similar to that of 2001 except for candidates of high ability who performed slightly better in the 'A' type questions.

A mark of 63 in 2002 was the mark closest to previous pass marks giving a similar percentage pass rate.

The cut-off at a mark of 98 for a Grade A award is lower than that of previous years and reflects a slight increase in the demands set by the marking schemes applied to the extended-response questions.

Comments on candidate performance

General comments

There were few candidates of very low ability and this can be related to the increase in the number of presentations in Intermediate 2 Level. However, in the case of candidates with scores of less than 35% in the national examination, it is a concern that Intermediate 2 would have been a more appropriate course. The question must also be asked as to whether these candidates had or had not passed the End of Unit assessments.

Areas of external assessment in which candidates performed well

- Respiration
- Dihybrid cross
- Temperature control
- Role of gibberellic acid
- Genetic engineering
- Membrane structure
- Cell wall structure

Areas of external assessment in which candidates had difficulty

- Meiosis
- Effects of IAA
- Importance of isolation
- Xerophyte adaptations
- Role of mRNA
- Phagocytosis
- Having identified a factor from data, justifying the answer
- Calculations
- Description of a pattern from data

Areas of common misunderstanding

- When asked to account for a change only a description of the change is given
- Identifying evidence from a graph to justify an answer
- When asked to “Explain why or how,” most candidates fail to link change to effect”
- Calculations in general
- When asked to extract information from a table, many candidates fail to recognise that the table headings have to be used within the answer

Recommendations

Feedback to centres

Ensure that candidates are aware that questions will test Problem Solving Skills and that there will be one question, valued at about 8 marks, which is based solely on the application of Data Handling Skills.

Ensure that candidates are aware that there will be one question, valued at around 8 marks, which will test an Experimental Situation.

Candidates should have more opportunities to develop the skills necessary for Data Handling and Experimental Situations.

The requirements for answering questions that ask candidates to Explain how or why, Account, Describe, Given the role of, etc should be emphasised.

Candidates should be made more aware of the requirements necessary to meet the criteria for Coherence and Relevance.

Appeals

Phase 1 of appeals in Higher Biology is now complete with over 1200 appeals processed. Feedback has been given to centres where appeals were unsuccessful.

The following is a summary of common reasons for unsuccessful appeals.

1. Information missing

- (a) assessment instrument
- (b) marking instructions or criteria
- (c) candidate evidence
- (d) mark or grade on candidate evidence
- (e) cut off scores

2. Issues relating to the validity of the assessment instrument and/ or marking scheme

- (a) Sufficiency of evidence: knowledge and skills not adequately sampled
 - Too high proportion of PS questions
 - Over assessment of data handling skills
 - Under assessment of problem solving skills in a practical context
 - Questions set in a practical context which test KU and not the PS skills detailed in the External Assessment Specification of the arrangements document.
- (b) Sufficiency of evidence: 'prelim' concentrates on early part of course; no additional evidence
 - No evidence for course work for Unit 3 supplied: evidence for an appeal must cover all component units of the course
 - NAB tests do not provide evidence of attainment at course level
 - High scoring NAB evidence for the unit not covered in the 'prelim' can only support an appeal for Grade C

- Low scoring NAB evidence for Unit 3 does not support appeal for C Grade
 - Appeals for Grades A and B require evidence of course attainment of the appropriate grade for all units in the course
 - Where evidence of performance in all units was provided, sometimes there was no indication of how both assessments (usually a prelim covering Units 1 and 2 and a second test covering course level work for Unit 3) were used in order to obtain the final candidate estimate.
- (c) Level of demand of evidence: tasks/questions set at too low a level (do not meet grade descriptions)
- Insufficient A type questions of the ‘explain, account, with supporting argument..’ variety.
 - Complexity of data does not meet the specifications in the arrangements document.
- (d) Level of demand of evidence: mark allocation over-generous
- Too many marks allocated to questions which in external exam would have only 1 or 2 marks allocated.
- (e) Level of demand of evidence: cut-off score(s) set too low
- This is often because of insufficient A type questions or over-generous allocation of marks to questions or because of a marking scheme which is over generous in terms of demands required to gain the marks.
- (f) Integration: insufficient activities requiring knowledge to be retained over extended period of time.

3. Issues relating to the reliability of the assessment decision

- (a) Concerns that the assessment is in the public domain and may have been seen by candidate
- Use of the specimen paper and questions in it should be avoided since the paper is available on the SQA website together with its marking scheme and therefore its use calls into question the reliability of the assessment
 - Use of questions from past papers which are available from commercial publishers together with the marking schemes should be avoided. Questions should be adapted as much as possible and care should be taken to select from as wide a variety of sources as possible when compiling a prelim paper.
- (b) Too much of the assessment is based on a single past paper
- (c) Ambiguities or technical errors in some questions and marking scheme
- (d) Problem in application of marking scheme: inconsistencies in interpretation
- (e) Problem in application of marking scheme: leniency in interpretation
- Lenient application of marking scheme for extended-response questions
 - Marking scheme for extended-response questions lenient with too many possible marks available.
- (f) Problem in application of marking scheme: clerical errors in addition of scores.

4. Biology specific issues

- (a) Insufficient demands for mark allocation in extended-response questions
- (b) Over allocation of marks to extended-response questions

- (c) Data handling questions lack sufficient complexity
- (d) Lack of evidence of high order problem solving skills
- (e) Over/under allocation of marks to one skill eg selecting or presenting information, conclusions, evaluation
- (f) Inadequate assessment of practical problem solving skills
- (g) Too many KU multiple choice questions
- (h) Multiple choice questions too easy.

Recommendations to centres

1. Centres are referred to:
 - The arrangements document for Higher Biology (Fifth edition June 2002, pp36-38) which details the External Assessment Specification. Assessment instruments used for evidence for appeals should meet the specifications as detailed.
 - External Assessment CD Rom (HSDU in conjunction with SQA and Media Matters; Distributed by Learning and Teaching Scotland, January 2001)
 - The document: *Guidance on generating evidence for National Course Estimates and Assessment Appeals* Second edition Feb. 2001- publication code A0992/2.
 - The letter issued to centres from Hugh Gordon in Feb 2002 with *Notes of guidance for Centres on the Appeals process and on the preparation of evidence to support estimates and Appeals* which is also available on the SQA website on www.sqa.org.uk.
2. Centres should ensure that evidence is submitted covering all aspects of the exam ie multiple choice questions, structured questions, extended response questions, data handling questions and experimental questions (all 7 PS categories must be tested, see page 38 of arrangements, June 2002).
3. Centres are advised to note that standards are best exemplified in the actual examination papers 2000-2002 rather than the specimen paper.
4. Centres have been supplied with stats for the multiple choice questions used in the 2000-2002 examinations. Care should be taken to ensure that a range of questions of varying difficulty are included to ensure coverage of the Grade Descriptions. The National Examination paper multiple choice section is compiled to an average facility value of 0.56 (for each question the higher the facility value the easier the question). Given the advice in 3a above, centres should try to adapt the questions as much as possible and at the very least change the key (ie the correct answer) if the question is to be used in a prelim.