

2. Aims

The aims should provide an aspirational statement about what a student will gain from studying the qualification.

2a. Do you think that the aims for this subject, as currently stated, are appropriate?

Yes/No

If not, please indicate what you think should be changed or added.

No, there is a need to include provision of opportunities for further study in science, leading ultimately to more young people working in the fields of science.

2.1e) could be better phrased to read 'recognise the value, use and implications of the subject in society'.

3. Content

The content in the subject criteria represents the core material (skills, knowledge and understanding) that should be present in all specifications and thus for all students, irrespective of awarding body. Note that this does not make up the total content of a final specification. Awarding bodies introduce additional and optional material that make the volume of material to be studied appropriate for an A level subject.

The content for each subject has been reviewed to ensure that it meets current requirements. Content demands have been increased at A2.

3a. Is the content for this subject current/up-to-date?

Yes/No

If not, please explain why not.

No, our consultations with those involved in teaching biology, chemistry and physics all indicate strong concerns about the lack of contemporary contexts and content for these subjects. For example, gene-environment interactions and gene regulation should be included within a modern biology course whilst inclusion of quantum behaviour of particles (in addition to photons) plus optics and imaging would enhance physics. The current draft content is uninspiring for teachers and students and may well lead to uninspired courses with reduced student uptake.

3b. Is the content appropriately allocated to AS and A2?

Yes/No

If not, please explain why not.

No, whilst some topics can be more easily allocated to either AS or A2, others act as building blocks at AS to prepare students for further study and progressive development of conceptual understanding at A2.

AS can be a stand alone qualification and so it should include some study of core topic elements which in the current drafts appear only at A2. For instance DNA, RNA and inheritance are important areas for AS as well as A2 in biology.

The draft allocation of topics between AS and A2 for physics would result in increased teaching time and difficulty for students at AS, and may well adversely affect student uptake for physics.

There is a need to consider the content of the range of GCSEs on offer from 2006 and student entitlement to study 3 GCSEs when drafting the content topics for AS sciences in particular.

3c. Does the A level content enable appropriate progression to further study in this subject?

Yes/No

If not, please explain why not.

No, the current drafts do not adequately exemplify the breadth and depth of contemporary biology, chemistry and physics as required for progression to further study. It is hoped that re-examination of the drafts and the remaining 40% of AS and A2 specifications will address this issue.

Some additional mathematical skills from Appendix 8 need to be identified as necessary for further study, such as 8.3h, 8.3j and 8.4j for chemistry.

3d. Is the content in your subject appendix specified to an appropriate level of detail and in the most appropriate format?

Yes/No

If not, please explain why not.

No, there needs to be some guidance on depth and breadth, ideally with some exemplification for topics, such as 2.4c (use of energetics to predict feasibility of reactions) for chemistry.

3e. The skills section has been removed from the new draft criteria (experiment and investigation, planning, implementing, analysing evidence and drawing conclusions, evaluating evidence and procedures) and has been subsumed within the assessment objectives. Are skills still emphasised sufficiently in the criteria?

Yes/No

If not, please explain why not.

Yes, however it should be made clear whilst the skills are represented in the assessment objectives, they form an important part of teaching and learning not just because they are required for assessment.

4. Assessment objectives

Assessment objectives have to assess the content of the qualification. They should include the essential competences that students need to demonstrate, eg knowledge and understanding, application of knowledge and understanding, analysis, synthesis, evaluation, practical skills. There should be no overlap between assessment objectives in respect of these competences in order to avoid over-assessment/repetition.

4a. Do the assessment objectives indicate clearly what is to be assessed by the qualification?

Yes/No

If not, please explain why not.

Yes.

4b. Is there any overlap between assessment objectives, ie do any competences occur in more than one assessment objective?

Yes/No

If not, please explain why not.

No.

4c. Are all of the competences essential to the study of this subject at advanced level?

Yes/No

If not, please explain why not.

Yes.

4d. Have any competences that are essential to the study of this subject at advanced level been omitted?

Yes/No

If not, please explain why not.

No.

4e. Do the assessment objectives (and in particular AO3) adequately ensure progression from the new key stage 4 programme of study on "How Science Works"?

Yes/No

If not, please explain why not.

No, there could be more emphasis on competences involved in planning to test a scientific idea, and on how scientific ideas may change over time.

A more comprehensive response to this question may be provided once the new KS4 Programme of Study has been through a full teaching and assessment cycle, in 2008.

5 Progression and relative weightings of assessment objectives

There should be a clear progression from AS to A2. The greater demand at A2 is reflected in greater importance being given to the higher order skills (eg evaluation, synthesis). These higher order skills are given a greater weighting in the assessment objectives.

5a. Are the relative weightings of the assessment objectives appropriate at AS?

Yes/No

If not, please explain why not.

Yes.

5b. Are the relative weightings of the assessment objectives appropriate at A2?

Yes/No

If not, please explain why not.

Yes.

6. Scheme of assessment

As part of this review, there is an intention to reduce the burden of assessment, and to this end, subjects, where possible, have been asked to move to a four-unit structure (2AS + 2A2 units).

In addition, to improve the reliability of assessment, internal assessment will be included only where necessary.

The effect of changing to this structure can be exemplified as follows:

Model 1:

No direct assessment of practical work. All assessment objectives assessed through external written assessment.

Unit 1	AS	Written examination
Unit 2	AS	Written examination
Unit 3	A2	Written examination
Unit 4	A2	Written examination

Model 2:

Direct assessment of practical work at AS and A2.

Unit 1	AS	Assessment of practical work
Unit 2	AS	Written examination
Unit 3	A2	Assessment of practical work
Unit 4	A2	Written examination

Model 3:

Direct assessment of practical work only at A2. Assessment objectives assessed through external assessment at AS.

Unit 1	AS	Written examination
Unit 2	AS	Written examination
Unit 3	A2	Assessment of practical work
Unit 4	A2	Written examination

6a. Which model do you prefer?

- Model 1
- Model 2
- Model 3
- None of these

If none of these, please describe your preferred model.

None of these.

Proposals for changes to assessment that reduce the burden on teachers are welcome. However the reduced flexibility in assessment offered in the three proposed models appears to go against the welcome move towards more flexible courses and assessment coming into effect with KS4 from September.

For the sciences, experiment, investigation and practical skills are essential and so their assessment is important for both formative and summative use. It is difficult to see how the practical skills (AO3 and essential skills in Appendix 9) can be assessed fairly through external assessment.

Internal assessment or coursework for A level sciences, when externally moderated for assessment purposes, is to be valued as it can encourage personal commitment, subject and skills development, and quality work outputs; particularly as research indicates, for girls.

In developing the post 16 schemes of assessment we would wish there to be a continuation of the good practice which includes a range of approaches so all the students can most effectively demonstrate what they know, understand and can do. We also recommend the schemes of assessment be constructed to incorporate and benefit from new approaches to assessment, including the use of ICT, and evolve to include the best of new approaches as they emerge.

It appears unlikely that split internal and external assessment units will be allowed. Therefore this could result in internal assessment units of 30% minimum at AS and/or A2. For some sciences this may be too large a weighting for practical work. The externally assessed unit would consequently be 70% of AS and/or A2. The result would be 'terminal' assessment at both AS and A2, with no possibility of modular assessment.

A preferred model is four units with limited internal assessment, perhaps based around previously gathered practical data, within largely externally assessed units.

Another model worth exploring is that of six units with two of the units limited to internal assessment and 20% weighting maximum.

6b. Are there aspects of this subject that cannot best be assessed through external assessment?

Yes/No

If yes, please identify the aspect(s) and explain why they cannot best be assessed through external assessment.

Yes, the practical nature of science and its investigative skills, including designing and carrying out experiments cannot be adequately assessed through external assessment, as they require considerable time for reflection not provided in the examination situations.

6c. If you think that there should be internal assessment, is there a rationale for making it optional?

Yes/No

If yes, please give details.

Yes, but only between specifications, not within a particular specification, so acknowledging parity of opportunity and outcome is provided.

6d. Is the description of synoptic assessment appropriate for this subject?

Yes/No

If not, please explain why not.

No, the description may be clarified by replacing 'particular situation or context' with 'unfamiliar situations or contexts'.

7. Meeting the aims of the subject criteria

It is important that the aims of the qualification are met collectively by the choice of content, assessment objectives and the scheme of assessment.

7a. Having had an opportunity to review the content, assessment objectives and the scheme of assessment, do you think that the stated aims of the qualification are met by these criteria?

Yes/No

If not, please explain why not.

No, more modern contexts and content are required together with more flexible approaches to the assessment of practical skills; without these resulting courses may be narrow and unattractive to both teachers and students.

8a. Do you see any requirements in these criteria that you believe might restrict any disabled candidates' access to the qualification?

Yes/No

If yes, please list them in the table below and indicate whether you believe the requirement to be essential, desirable or not needed in the assessment of this subject.

No, however clarification needs to be provided on suitable modifications that can be made for students with certain disabilities such as colourblindness.

Requirement restricting access	Disability group(s) likely to be restricted	Essential	Desirable	Not needed

9. Stretch and challenge

The White Paper remit requested that AEA-style material be introduced into A levels to stretch the most able and recognise their achievement through an appropriate grading system.

We are taking this opportunity to seek your views on how best this might work in your subject. The regulatory authorities will be commissioning awarding bodies to trial various models of this in spring and summer 2006. The final decision will be based on all of the evidence. In all cases grade A will be set at the same standard as previously.

9a. Should the AEA-style assessment be:

(i) additional to the A level paper and optional for the candidate? In this model, performance would be graded separately from the A level grade?

OR

(ii) integrated into A2 and therefore compulsory for all candidates? In this model, high level of performance would be recognised through the introduction of additional grades above grade A?

Please give a reason for your response.

(ii) compulsory and integrated into A2, where the design of the questions (and overall examination) should be such that, whilst they are accessible by all, they provide opportunities for A grade students to demonstrate their knowledge, skills and understanding beyond the basic explanation. Further exploration of existing assessment tools, the raw marks, for effective discrimination at the top end is also to be encouraged.

9b. If you think that it should be additional and optional, should the AEA-style assessment be timetabled:

(i) in the same session as an A2 paper to improve ease of accessibility to candidates?

OR

(ii) in a separate session from A2 papers?

Please give a reason for your response.