

SCORE – Science Diploma: recommendations

1. *Why is more time required to develop the science diploma(s)?*

- 1.1. In October 2007, the Secretary of State announced three further (Phase 4) Diplomas in science, humanities and languages to be available from 2011. The Secretary of State said: “These new subject-based Diplomas will secure the benefits of Diplomas for all young people. They will provide a wider curriculum offer for those young people who want to secure both the theory and practical skills they need to excel in study, work and life”.
- 1.2. SCORE believes that in order to ensure that the Science Diploma meets these aspirations, and is a high quality qualification, action is required in the areas outlined below.
- 1.3. **SCORE recommends:**
- 1.4. ***In order to carry out these actions, the introduction of the Science Diploma is delayed until September 2012.***

2. *Clarity of vision and purpose*

- 2.1. SCORE is concerned that the vision for the Science Diploma is far from clear and its ambitions are unrealistic.
- 2.2. **SCORE recommends:**
 - ***The Science Diploma be renamed to recognise that it covers the sciences and to illustrate to potential students why it is different to the alternative options. For example - Diploma in the Sciences or Applied Sciences Diploma***
 - ***The Advanced Diploma is designed to progress clearly from the Applied Science GCSE, as well as from the Higher Diploma***
 - ***Advanced Level ASLs are developed that enable students to specialise in the sciences without needing to study A’ Levels***
 - ***The SDDP membership is reviewed and that representatives of GFE colleges, work-based providers and SMEs are included.***

3. *The ability of a single Science Diploma to meet the needs of HE and Employers*

- 3.1. SCORE believes that an Applied Sciences Diploma would provide a new way of learning for a large proportion of students who will engage in studying the sciences in this manner. It will not, and cannot provide meet the needs of all students.
- 3.2. For example, those students interested in studying physics and computational sciences at university will not be able to gain sufficient grounding in mathematics and physics through this route. In addition, many students who study mathematics at university study sciences and further mathematics at A’ Level and they would not be able to cover these areas in an Applied Sciences Diploma.

3.3. In addition, there will also be students who would like to enter HE with a thorough grounding in their discipline, but would also welcome some additional learning in other areas, such as the languages and humanities. It is hard to see how that will be possible through a single Science Diploma.

3.4. **SCORE recommends that the following issues are considered:**

- **Whether the PL and ASL on offer provide the right level and range of learning for students entering the full spectrum of HE courses**
- **Whether the workforce is in place to expand the number of students engaged in studying the sciences at Level 3**
- **Whether schools and colleges have the resources and capacity to teach an additional qualification in the sciences**
- **Whether an additional Science Diploma is required to fulfil the stated vision of the Science Diploma.**

4. Teacher and curriculum developer involvement

4.1. The 2006/7 Select Committee Report on the 14-19 Diplomas highlighted concerns about the late involvement of education professionals in the Diplomas design process (para 63 & 64). In addition, the report noted "Evidence we received from awarding bodies made the point that they, as well as teachers, had not been involved in the Diploma development process until a very late stage in proceedings (para 66)." The report also mentions that not all employers are firmly behind Diplomas: While some employers are supportive "... other evidence was more circumspect about the level of employer involvement in the Diploma design process" (para 60).

4.2. SCORE believes that this advice must be acted upon during the development of an Applied Sciences Diploma.

4.3. **SCORE recommends that during this development of the Line of Learning, Criteria and Specifications, and any development of new Additional and Specialist Learning:**

- **The Science Diploma Development Panel's (SDDP's) Line of Learning writing group establish a thorough review process (including focussed discussions and written reviews) whereby the Line of Learning and Additional and Specialist Learning (ASL) receive regular review from expert review groups including those with teaching (vocational and academic) experience, specialist subject knowledge and curriculum development experience (vocational and academic)**
- **The QCDA continue to use these review groups during the development of the Criteria for the Principal Learning (PL) and ASL**
- **Involving as wide a range of teachers as possible during the development in order to ensure that:**
 - **An Applied Sciences Diploma(s) is a qualification that teachers feel engaged with**

- ***An Applied Sciences Diploma is not seen as something ‘imposed’ on them***
- ***The qualification can be realistically implemented in the majority of schools.***

5. Additional and Specialist Learning

- 5.1. SCORE recognises that students completing an Advanced Diploma must be able to enter Higher Education (HE).
- 5.2. However, the March consultation report suggests that the current PL does not meet the needs of HE or employers. The Chair of the SDDP has frequently stated that the ASL will enable this to happen.
- 5.3. SCORE is concerned that, as the Advanced Diploma is likely to attract students who may not enjoy the learning approach offered by A' Levels, there must be ASL qualifications offered in the sciences which have a similar teaching and learning style to the PL, not simply a reworking of A'Level Units.
- 5.4. Unlike in other Diploma Lines, very few, if any, ASL qualifications of this type already exist. For example, a search on vocationally related qualifications in science shows that there are BTECs of three different sizes, a certificate in laboratory skills, and a certificate in gemmology:
<http://www.accreditedqualifications.org.uk/QualificationSearchResults.aspx?Type=AdvancedQIn&Level3=Active&SectorSubjectAreas=02.1&QualificationType=VRQ&Page=1&PageSize=10>
- 5.5. **SCORE recommends that:**
- ***New science ASL qualifications should be developed in order to provide students with opportunities to deepen their understanding and extend their experience of the sciences***
 - ***These ASL qualifications should be developed in parallel with the PL, in order to ensure consistency of learning and teaching approach and of content.***

6. Assessment

- 6.1. SCORE believes that little consideration has as yet been given to the assessment of the Diploma in the sciences. Assessment of an applied course, such as the proposed Science Diploma, should reflect the nature of the course's teaching and learning.
- 6.2. The recent Ofqual report "The new GCSE science examinations" highlights the need to have clarity regarding the variety of assessment styles used in order to ensure comparability of grades within and between awarding bodies. It also raises several issues relating to internal assessment.
- 6.3. Importantly, diplomas are different from existing qualifications in a number of respects. It is vital that the assessment of diplomas is carefully thought-out so that it is fit for this specific purpose. It is unlikely that simply transferring or adapting existing assessment that is used for other qualifications will be sufficient.

- 6.4. **SCORE recommends that:**

- ***A review of the assessment methods of GNVQ, NVQ and other applied or vocational qualifications in the sciences is undertaken in order to learn from their experiences***
- ***The Ofqual review on GCSE science regarding the different internal assessment methods currently in place for GCSE science is considered in the context of Diploma development***
- ***Teachers, schools and colleges have sufficient time and resources to familiarise themselves with the alternative assessments***
- ***Training is provided for teachers and those supervising work placements on assessment procedures.***

7. Awarding Bodies

- 7.1. SCORE recognises that there is space within the curriculum landscape for a new, multi-disciplinary science qualification, with an applied focus.
- 7.2. SCORE notes, however, that previous experience of introducing new and radically different science curricula and assessment suggests that sufficient time for developing, piloting and evaluating the specifications and assessment is essential.
- 7.3. SCORE believes that many of the issues highlighted in the Ofqual report on the new GCSE science examinations would have been avoided if the awarding bodies had had more time to develop and pilot assessment tools for new aspects of the course such as How Science Works.
- 7.4. ***SCORE recommends that:***
- ***The time given to the Awarding Bodies to develop new specifications is extended sufficiently to enable them to conduct small scale pilots of individual PL units, ASLs and assessment materials in order to ensure that they are fit for purpose.***

8. Mathematics

- 8.1. The consultation on the Line of Learning Criteria clearly highlighted that the position of mathematics within the Diploma needs addressing. There was clear evidence that insufficient thought has been given to mathematics within the Diploma.
- 8.2. SCORE believes that the place and assessment of mathematics within science qualifications also needs addressing in GCSEs and A' Levels in the sciences and is beginning some work in this area.
- 8.3. ***In order for these issues to be addressed, SCORE recommends that during the development of the Line of Learning and Criteria:***
- ***A review of existing examples of embedding and assessing mathematics within science courses (both academic and vocational) is carried out for the proposed Expert Group***
 - ***A clear rationale for the inclusion of mathematical concepts within each PL unit, based on the needs of employers and HE, is developed by the SDDP with involvement of the science and mathematics education communities***

- ***A PL unit on mathematics is developed for the Advanced Diploma***
- ***A review of Free Standing Mathematics Qualifications and other existing Level 3 mathematics qualifications is carried out for the SDDP - involving the mathematics community, Awarding Bodies and the Engineering Diploma Development Partnership.***

9. *Extended projects*

- 9.1. SCORE welcomes the inclusion of an extended project within the Diploma. SCORE also believes that students studying A' levels and intending to enter Higher Education would benefit from completing an Extended Project.
- 9.2. SCORE also welcomes the decision of the Government to enable the British Science Association to triple the number of students undertaking mini research projects, as this could provide further for students undertaking Extended Projects.
- 9.3. ***SCORE recommends that:***
- ***The SDDP establishes a working group, including advisors familiar with existing schemes and qualifications with a project element, to:***
 - ***Conduct a needs analysis to ensure that issues relating to the delivery of this aspect of the Diploma are captured and can then be addressed***
 - ***Develop the Extended Project to ensure it meets the needs of all students studying the sciences at Level 3***
 - ***Prepare guidance for schools and students***
 - ***Develop training (in conjunction with Science Learning Centres) for teachers and scientists supporting extended projects***
 - ***Develop rigorous assessment procedures for the Extended Project.***

10. *Parity*

- 10.1. SCORE has previously raised concerns regarding the relative difficulty of different A' Levels. SCORE believes that it is essential that the Phase 4 Diplomas in particular are seen as comparable with each other and with earlier Diploma Lines.
- 10.2. ***SCORE recommends that:***
- ***The SDDP is presented with regular updates on the Line of Learning, Criteria and assessment of the humanities and languages diplomas.***