

GCSE Science: Decisions on Conditions and Guidance



In March 2015 we published a consultation about the rules and guidance we proposed to put in place for reformed GCSEs (graded 9 to 1) in science.

We have reviewed the responses to the consultation and are now announcing our decisions. We are also publishing a more detailed analysis of the responses alongside this document.¹

Conditions and guidance

Compliance with subject content

We proposed to introduce a Condition that required GCSEs in science to comply with the Department for Education's subject content for GCSEs in single science² or combined science³ (as appropriate), and with our assessment objectives.

Most respondents did not comment on these proposals, and those who did supported them. This is the approach we have taken for all other reformed GCSEs and we see no reason to take a different approach for science. We have therefore decided to confirm this proposal.

We also proposed to publish requirements that clarified how exam boards should interpret certain aspects of the subject content. Although views were more mixed here, the majority of respondents largely supported our proposed approach.

We have decided to adopt our proposed requirements, with minor changes to their wording to clarify our expectations.

Tiering

We proposed to introduce Conditions and requirements to give effect to our earlier decision that science GCSEs should be tiered.

¹ www.gov.uk/government/consultations/gcse-reform-regulations-for-science

² www.gov.uk/government/publications/gcse-single-science

³ www.gov.uk/government/publications/gcse-combined-science

Respondents broadly supported our proposals and welcomed the use of tiering in science GCSEs.

We have decided to adopt our proposed Condition and requirements in full, with minor changes to the wording of our requirements for clarity.

Assessment requirements

We proposed to introduce a Condition and associated requirements that:

- specified minimum assessment times of 3.5 hours for single science GCSEs, and 7 hours for combined science GCSEs;
- gave effect to our earlier decisions on the weighting of mathematical skills and the assessment of practical work;
- specified a minimum level of demand for mathematics; and
- required assessment of 'working scientifically' across the assessment objectives.

Most of the respondents who commented felt that our proposed minimum assessment times were too long (and could disadvantage students with some disabilities). Some respondents also felt that our proposed minimum level of demand for mathematics was unclear (or unnecessary).

We remain of the view that our proposed minimum assessment times need to be viewed in the context of other reformed GCSEs (where the lowest total assessment time we have suggested is 3.5 hours). Combined science will represent two GCSEs – so the amount of subject content on which students are assessed (and therefore the amount of assessment) needs to reflect that.

Similarly, we believe that it is important to set minimum levels of demand for mathematical content, as this will ensure that all students face an appropriate and comparable degree of mathematical challenge that is in line with the curriculum intentions. In any event, our requirements mean that exam boards will need to ensure that any mathematical content is appropriate to the scientific context.

We have therefore decided to adopt our proposed Condition and requirements unchanged.

Practical work

We proposed to introduce a Condition that:

- implements our earlier decision that exam boards should set out mandatory practical activities for science GCSEs (eight for single science subjects, 16 for combined science), and which cover the apparatus and techniques specified in the subject content; and
- requires exam boards to collect annual statements from schools confirming that they have taken reasonable steps to secure that students have completed (and recorded) the required practical work.

Respondents commented as follows:

- It was important that practical activities in combined science provided a balance between biology, chemistry and physics.
- It was not clear what ‘reasonable steps’ schools should be expected to take to ensure that students complete practical work, or what evidence they would need to provide to demonstrate this.
- It was not clear how the annual statements would be monitored, when exam boards should intervene and request evidence to support the annual statement, or what penalties schools would face if they failed to offer practical work.

Our requirements mean that practical activities in combined science will need to cover the full range of apparatus and techniques set out in the subject content. So all students should experience, as a minimum, a common set of practical requirements in each of biology, chemistry and physics.

We do not think it is appropriate for us to specify what form the evidence of students’ practical work should take. We want to give schools and exam boards the freedom to develop approaches that best suit them, support good teaching practice, and avoid imposing unnecessary administrative burdens. We also want to make sure that the emphasis in these new qualifications is on students completing – and learning from – practical work, rather than on recording that work in a particular way.

We have decided to adopt our proposed Condition unchanged.

Targeting assessment objectives

We proposed to introduce requirements that give exam boards some limited flexibility to vary assessment objective weightings in an individual set of exams, provided that they meet our specified weightings over a four-year period.

Views were mixed on this proposal. Several respondents expressed concerns that the requirement to match weightings over four years could unnecessarily constrain assessment design, while others thought it provided useful flexibility.

We remain of the view that our specified weightings should be achieved over a four-year period. To do otherwise would either risk overly stringent restrictions on assessment design, or would allow persistent differences in weightings (and, potentially, the overall level of demand) between different exam boards, which would weaken comparability of GCSEs offered by different exam boards.

We have made some changes to the drafting of our requirements to clarify that assessment objective weightings need to match those we have specified over each four-year period separately, and not over a rolling four-year period.

Guidance on assessment objectives

We proposed to introduce guidance that clarified how our assessment objectives should be interpreted.

Most respondents did not comment on our proposed guidance. Those who did were concerned that our guidance on AO3 was overly complex and could make assessment design more difficult.

We wish to clarify the purpose of our guidance on AO3. We have divided this assessment objective into three strands with two elements each to give exam boards more flexibility over how they design assessments. For example, strand 2 ('analyse information and ideas to make judgements and draw conclusions') is divided into two elements to permit questions targeting only 'make judgements' or only 'draw conclusions', rather than just questions targeting both (which would be the case without separate elements). We have deliberately not specified target weightings for the individual elements of the different strands. Instead, we suggest balanced coverage of the three strands overall.

We remain of the view that our proposed guidance is appropriate and have chosen to adopt it unchanged.

Approach to rewarding recall

Our guidance included a recommendation that no more than 15 per cent of the total marks for the qualification should reward recall in isolation.

Views were mixed on this proposal. Some respondents supported it, others felt that 15 per cent was too low, and others felt it was unclear what type of question or mark would 'count' towards the limit, or what the remaining marks for AO1 should reward.

For clarity, our proposal was to restrict the amount of marks that students could receive for recalling knowledge, irrespective of how questions are structured. So, where a student simply has to recall facts to gain a mark, even as part of a wider

question, that mark would count towards the 15 per cent limit. The remaining AO1 marks would then reward demonstrating understanding.

Given that some respondents misunderstood our proposals, we have looked again at the wording of this part of our guidance. We remain of the view that our proposed wording is precise and that there is no better way we can word this guidance.

Other issues

Respondents also commented on a number of issues that were outside the scope of the consultation. These included:

- the subject content;
- the future availability of a single-award GCSE in combined science, or some other equivalent to the current 'core science' GCSE;
- our earlier decision that there will be no direct assessment of practical skills in GCSE science;
- our earlier decision to prohibit mixed-tier entry;
- the wording and weighting of assessment objectives;
- the weighting of mathematical skills in the different science subjects; and
- the use of a 17-point grading scale in combined science.

Issues relating to the subject content are a matter for the Department for Education, which carried out its own consultation on the proposed subject content,⁴ and has recently published revised versions of the subject content for single science⁵ and combined science.⁶

Similarly, the future availability of a single-award GCSE in combined science is a curriculum decision for the Department for Education.

Comments on our approach to assessing practical skills, tiering, assessment objectives and the weighting of mathematical skills did not raise any new issues that

⁴ www.gov.uk/government/consultations/gcse-subject-content-and-assessment-objectives

⁵ www.gov.uk/government/publications/gcse-single-science

⁶ www.gov.uk/government/publications/gcse-combined-science

would cause us to revisit the decisions we have made following our earlier consultations.

We understand the concerns raised by respondents about the possible complexity of a 17-point grading scale in combined science. At the same time, we think it is important that the grades for combined science reflect the fact that it is a double-award GCSE. The other option is a nine-grade system, where students get two grade 1's, two grade 2's and so on, up to two grade 9's. The disadvantage of this alternative approach is that students gain (or lose) two whole grades at each grade boundary.

We think a system that changes only one grade at each grade boundary is fairer and better reflects students' overall attainment. We will be consulting at a later date on the detailed arrangements for the awarding of the new GCSE grades (including in combined science).

Next steps

Alongside this document, we have published our *Subject Level Conditions and Requirements*⁷ and *Subject Level Guidance*⁸ for single science and combined science GCSEs.

New science GCSEs will be taught in schools from September 2016.

⁷ www.gov.uk/government/publications/gcse-9-to-1-subject-level-conditions-and-requirements-for-single-science and www.gov.uk/government/publications/gcse-9-to-1-subject-level-conditions-and-requirements-for-combined-science

⁸ www.gov.uk/government/publications/gcse-9-to-1-subject-level-guidance-for-single-science and www.gov.uk/government/publications/gcse-9-to-1-subject-level-guidance-for-combined-science