The assessment of practical work in GCSE science

1. Your details

We collect some standard details about all those who respond to our consultations.

The information you provide will be held by us. It will only be used to help us shape our policies and regulatory activity. We will treat your identity in confidence. However, we may wish to publish your organisation's view unless you inform us if you would not like us to do this.

Please provide us with the following information set out under the headings below.

Name:

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Would you like us to treat your response as confidential? If you answer Yes we will not include your details in any list of people or organisations that responded to the consultation.

No

Are the views expressed in response to this consultation your personal views or an official response from the organisation you represent?

Official response from an organisation/group

You selected 'official response from an organisation/group', please state which type of responding organisation you represent

Other representative group or interest group

Type of representative group or interest group

Subject association or learned societies

Nation

England

How did you find out about this consultation?

From our website

May we contact you for more information?

Yes

2. Consultation questions

Question 1

In relation to our proposed model (page 2 and pages 24 to 30 of the consultation) how far do you agree with each of the following statements?

1a: GCSE science students will be given appropriate opportunities to complete a range of practical work if exam questions reward those who can draw on their practical experiences.

Agree

Please give reasons for your answer

Ensuring that students are given appropriate opportunities to complete a range of practical work is essential. There is a difference in assessing practical work and using practical elements in a formative way and fostering an inquiring mind. In that sense, schools will still need to assess, but also use a more integrated curriculum approach using opportunities in other disciplines to embed core principles especially, for example, if schools are using BTECs to teach engineering alongside the GCSE Science curriculum. In this way, students will have a rich range of experience on which to draw to help them to answer appropriately crafted exam questions.

1b: At least 15 per cent of the marks in science GCSE exams should be allocated to questions drawing on students' practical science experiences.

Agree

Please give reasons for your answer

This should be a maximum to avoid marks being taken away from other imporant subjects

1c: Science GCSE students will be more likely to be given opportunities to undertake a wide and varied range of practical work if such work is focused on teaching and learning and is not itself assessed.

Agree

Please give reasons for your answer

See 1a above. We have some residual doubt, however, that if the work is not formally assessed, it won't be done. The questions really must be carefully crafted to ensure that they really are designed to give students with practical experience a real advantage over those without.

1d: Science GCSE students will be more likely to be given opportunities to complete the practical work included in an exam specification if schools are required to confirm this in writing to their exam board.

Agree

Please give reasons for your answer

1e: Science GCSE students will be more likely to be given opportunities to undertake a wide and varied range of practical work if they are required to keep a record of such work (a student record).

Agree

Please give reasons for your answer

1f: It would be unmanageable, in terms of time and cost, for teachers to assess directly each of their science GCSE students manipulating a range of equipment and conducting a range of experiments to confirm their competency in practical skills.

Agree

Please give reasons for your answer

We agree that the proposals present a pragmatic solution to the problem of under-resourcing but would re-iterate the importance of properly resourcing science teaching - in both terms of sufficient numbers of appropriately qualified teachers and in access to a range of, what is actually relatively low cost, equipment.

NB the Scottish system assesses experimental work at pass/fail. Within each unit (typically 3 per year per subject), students must write up one report on an experiment, which may be called in for external verification. Teachers confirm that the pupil carried out the work and that the work and report reached a satisfactory standard. Students must reach a satisfactory standard on the experiment for each unit before they can take the final exam and obtain a grade for the course. An examination of the efficacy of this arrangement might be informative.

1g: The revised assessment objectives for science GCSEs are appropriate.

Agree

Please give reasons for your answer

1h: The weightings proposed for the revised assessment objectives for science GCSEs are appropriate.

Agree

Please give reasons for your answer

1i:The weightings proposed for the assessment objectives for science GCSEs should be the same at each tier.

Agree

Please give reasons for your answer

1j: The proposal that no less than 15 per cent of the total marks available in a science GCSE must be used to credit the demonstration of mathematical skills is appropriate.

Strongly agree

Please give reasons for your answer

Teaching mathematics in its context is essential for equipping students for both employment and higher level study.

1k:The proposal that no less than 15 per cent of the total marks available in a science GCSE must be used to credit the demonstration of mathematical skills should apply to each of the science GCSE subjects.

Strongly agree

Please give reasons for your answer

Teaching mathematics in its context is essential for equipping students for both employment and higher level study.

1l: The lists of apparatus and techniques that all students taking science GCSEs will be expected to be able to use are appropriate.

Agree

Please give reasons for your answer

Consider including mirrors and lenses for physics

1m: The proposal that exam boards must require each student taking science GCSEs to undertake at least eight practical activities (16 for combined science) is appropriate.

Strongly agree

Please give reasons for your answer

We regard this as essential

Question 2

Do you have any views about what form the student record should take and the types of information it should contain? If 'yes', please give suggestions below.

Yes

Suggestions

The key requirement should be for the record to be a document that is written in “real time”, not a formal report written after the event, thus, a record should be written at the time, as the experiment is conducted, in a firmly bound book. It should be clear enough that another person can follow the account; this depends mostly on layout and structure rather than absolute neatness

It need not repeat material from the instructions other than the title and aims of the experiment.

All observations should be recorded as they take place, followed by calculations required and conclusions.

The importance of, and reasons for, keeping a lab book should be explained to learners. Its requirements in university level study and in a professional lab; its use as evidence in demonstrating ownership of intellectual property and contribution to the work of a larger team, for instance, is both useful for the learner but demonstrates its real practical point and not just its necessity for the passing of an exam. Thus, having the learner record some wider aspects of their experimentation such as how much the materials cost, where they came from etc in addition to the methodology selection, data collection, analysis and conclusions.

Further, a simple lab book is cheap, accessible and practical.

Question 3

We are looking for the approach to the assessment of students’ practical science experience that can achieve the best balance between the aims of:

delivering the curriculum aims and encourage a wide range of practical science teaching over the period of study
being manageable for schools – taking into account the numbers of students who take science GCSEs, the range of ability and the time typically allocated to each subject
providing valid and reliable assessments – test the right things and do this accurately and consistently, so as to differentiate effectively between students’ performance
being able to withstand accountability pressures, that is, to avoid exerting unmanageable contradictions on teachers where they are acting as the assessor and being judged themselves through the outcomes of the assessments they make – the results of their students.

How far do you agree that our proposed model (page 5 and pages 23 to 29 of the consultation) provides the best balance between these aims? Please give reasons for your answers.

Agree

Please give reasons for your answer

Question 4

Do you believe that there is an alternative option that can provide a better balance between these aims?

Yes

Question 5

If you responded 'yes' to question 4, which of the options below do you believe provides a better balance between these aims when used in addition to some science GCSE exam questions drawing on students' practical science experience? Please give reasons for your answer.

Option (i) science GCSE students' practical skills are directly assessed and marked and that mark contributes to the overall grade. The practical skills are assessed by:
teachers observing students during the course
a practical exam testing students' technical and manipulative skills
an extended investigation including direct assessment of practical skills
a portfolio of experiments, detailing methodologies, results and conclusions and including direct assessment of practical skills.
Option (ii) science GCSE students' practical skills are assessed on a pass/fail basis related to competency with that outcome reported alongside the grade derived from their performance in the exams.
A different option that has not been covered in our consultation (please give full details of your proposed option).

A different option

Please give the details of your proposed option here.

Another option could be the Scottish approach, where pupils must complete a number of experiments to a satisfactory standard before they are allowed to take the examination but the experiments do not contribute to the final grade.

Question 6

We have identified some ways in which our proposals for science GCSEs would impact (positively or negatively) on persons who share a protected characteristic. Are there any potential impacts we have not identified?

No

Question 7

Are there any additional steps we could take to mitigate any negative impact from resulting from these proposals on persons who share a protected characteristic? If so, please comment on the additional steps we could take to mitigate negative impacts.

No

Question 8

Have you any other comments on the impacts of the proposals on persons who share a protected characteristic?

No

3. Accessibility of our consultations

We want to write clearly, directly and put the reader first. Overall, do you think we have got this right in this consultation?

Yes

Do you have any special requirements to enable you to read our consultations? (For example screen reader, large text, and so on)

No

Which of the following document formats would you prefer to use when reading our consultations? (Select all that apply)

A standard PDF
Accessible web pages

How many of our consultations have you read in the last 12 months?

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