

Response from the School Mathematics Project to QCA's overarching questionnaire on level 3 mathematics

1a In what capacity are you responding to this questionnaire?

Educational charity constituted to improve the teaching and learning of mathematics

1b Are you responding to this consultation as an individual or on behalf of a named group?

Named group: The School Mathematics Project

2a A level mathematics should be separate from A level further mathematics and provide the same general grounding in mathematics for all students (Model A).

Disagree

Separating mathematics from further mathematics would make it costlier for some schools to offer further mathematics because they would no longer be able to run classes covering M1, M2, S1, S2, D1 and D2 attended by a mixture of mathematics and further mathematics students. It would be harder to attract certain students into the further mathematics programme if they knew that nothing they did for it could ever count towards a single subject mathematics qualification.

We entirely reject the proposal for an A level mathematics that provides 'the same general grounding in mathematics for all students'. While the present arrangements do involve some issues of qualitative comparability they nevertheless allow an acceptable degree of individualisation in response to students' varied aspirations and are well understood by users of the qualification. By contrast, model A would involve bitty and shallow coverage of three areas of applied mathematics, making it impossible for students to get to grips with the distinctive mode of thinking that goes with each area. It would be a taster course in applied mathematics and significant topics would go into near-eclipse at this educational level. Here and elsewhere in our responses we find ourselves closely in agreement with the publicly expressed views of Mathematics in Education and Industry on the A level aspects of these proposals.

No cogent arguments or examples have been put forward to persuade us that the model would allow links to be made more easily between pure and applied content.

The proposed changes would be expensive and educationally deleterious, and would risk reducing the A level mathematics uptake just when it is recovering from the disastrous fall brought about by QCA's 'Curriculum 2000' changes.

The fact that some students struggle with, or drop out from, A level mathematics, when their peers thrive in other A level subjects on the basis of similar GCSE grades, is best addressed by reforming GCSE mathematics courses – particularly those dominated by ill-structured modular GCSE specifications.

2b Which of the alternative models would be your preferred option?

None of the above.

Insufficient detail about any of these alternatives has been provided for us to be prepared to endorse it. To the extent that it meant 'no change', D1 would have some support from us and B1 would be worth considering if it were certain that greater coherence in pure mathematics teaching programmes would result. One thing that must change is the absurdity of banning the calculator from a module (Core 1) that requires quadratic equations to be solved; a requirement for some answers to be given 'exactly' (not as calculator outputs) must of course remain.

3a Do you think that pure mathematics content, comprising one-third of the AS and one-third of the A2, should be common to all further mathematics specifications?

Disagree

A common core for the FM AS is relatively easy to settle on: but as it is likely to differ little from most boards' current Further Pure 1 modules it is not clear what would be achieved by imposing it or that the cost could be justified. Boards' FM A2 applied modules build in distinctive ways on their FM A2 pure modules. A common core for FM A2 has the potential to disrupt these relationships and force a degree of standardisation on the applied modules where, again, we consider there is a need to maintain diversity. Here and elsewhere in our responses we find ourselves closely in agreement with the response to this consultation from the Joint Mathematical Council for the UK.

4a FSMQs should be used with both use of mathematics and use of statistics.

Agree

4b The name of 'statistics' should be changed to 'use of statistics' to make this a coherent group of linked qualifications.

Agree

4c Use of mathematics is currently available as an AS level but also as a full A level in a pilot. There should be a full A level in use of mathematics.

Agree and it should continue in pilot until a later date

The idea (essentially of Functional Skills (Mathematics) at level 3) is attractive in principle but there are (countervailing) concerns that (a) some students or schools/colleges attracted to it may overestimate the value users put on it, and suffer as a result, while (b) other students may shun it as a second-class qualification (as they did CEE and the like). As with level 2 Functional Skills (Mathematics) it is important that learning leads to confident and flexible thinking through which core knowledge of elementary mathematics is adapted to a wide range of practical situations and away from 'realistic' tasks that are broken down into easy steps for the learner or are artificial in other ways.

5a Do you agree that this proposed suite of qualifications contains qualifications that will meet the needs of all learners who wish to select mathematics for the extended core of their Advanced Extended Diploma?

Disagree

At the moment too little is clear or convincing about 'this proposed suite' or about the Advanced Extended Diploma to answer this question in the affirmative.

5b Do you agree that the suite contains qualifications that offer the flexibility to be contextualised in a Diploma line of learning?

Disagree

As developers of curriculum materials we know that 'the flexibility to be contextualised' is a difficult thing to judge and not enough detail is available. In our response to 4c we warn against artificial contextualisation.

6a The proposals (ie mathematics, further mathematics, use of mathematics, use of statistics and FSMQs) will provide a coherent set of pathways for mathematics at level 3 covering the needs of all learners.

Disagree

As indicated in earlier responses we have doubts about the coherence of some aspects of the suite and feel we are being told too little about other aspects.

7a The revised specifications in AS/A level mathematics and further mathematics should be introduced in 2012 to align them with the changes to the key stage 4 programme of study and the revised GCSE in mathematics which will be introduced in 2010.

Disagree

We are unwilling to endorse a timeframe for proposals that are in so many ways unsatisfactory. On the other hand, the calculator restriction could be removed without delay; piloting of combining C1 with C2 and C3 with C4 could begin without delay.

8a Given that the revised A levels in mathematics and further mathematics will have more 'stretch and challenge' questions in the A2 assessments, there will no longer be a need for an AEA-style examination in mathematics.

Disagree

We would question whether an adequate AEA element can be incorporated into the A level examination without the risk of demotivating many students and reducing uptake, and (unless the examining time is increased) reducing the reliability of the examination for most students.