



Qualifications and  
Curriculum Authority

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# **GCSE mathematics coursework**

*Consultation summary*

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2006

QCA/06/2737

## **GCSE mathematics coursework: next steps**

### **Background: GCSE mathematics coursework consultation**

QCA carried out a review of GCE and GCSE coursework arrangements, which reported in November 2005. The review used postal questionnaires and interviews to gather evidence from teachers, students and parents about their experience of, and views about, coursework. The review drew on a sample of subjects, one of which was mathematics.

The evidence relating to mathematics GCSE coursework was striking. In contrast with all other subjects a substantial majority of mathematics teachers (66%) disagreed with the proposition that coursework was valid and reliable. In addition, the mathematics teachers showed the highest levels of concern about different aspects of coursework, such as authenticating candidates' work. There was particular criticism by teachers of the data-handling aspect of mathematics coursework; this was felt to be too open-ended and to rely too much on students' literacy.

In the light of this evidence, and the subsequently received remit from the Secretary of State, QCA believed that the case for continuing with the coursework requirement for mathematics GCSE was not obvious, and that the opportunity should be taken to consult with teachers, students and awarding bodies on this issue.

### **Web-based consultation**

Teachers, awarding bodies and other interested professionals were consulted, via a web survey, and asked to respond to three main options:

1. To retain coursework requirements in their current form
2. To remove the handling data requirement (and embed assessment within the examination), but retain the using and applying mathematics element of coursework.
3. To remove all coursework requirements, and embed assessment of these elements within the examination.

An analysis of the results of the questionnaire is included at Annex 1. The consultation period started on 5 April 2006 and finished on 10 May 2006.

### **Recommendation**

Based on the outcomes of the consultation, we recommend that coursework is removed from GCSE mathematics specifications for first teaching in September 2007.

## Next steps

QCA's recommendation on the removal of coursework from GCSE mathematics specifications will be sent to Ministers. In anticipation of a positive response, we are meeting with the awarding bodies' mathematics subject officers on 5 July to agree the structural changes that will be required to the examination papers. The draft timeline below indicates the stages in the development and accreditation of new specifications.

## Timeline

Advice to Ministers recommending withdrawal of coursework.	16 June 2006
Cross regulatory authority meeting to include mathematics subject officers	End June 2006
Ministerial response	July 2006
Meeting between RAs and AB subject officers/development managers to agree structural issues (two/three papers/assessment model)	First week of July
Update on QCA website (and AB websites)	July 2006
Royal Statistical Society report on Data handling	July 2006
Formal QCA notification of assessment changes to centres	September
Draft linear proposals (specifications and SAMs) to RAs	Early-mid October
Formal submission of specifications and SAMs	End October
<i>(Timeline for modular specifications to be agreed following July meeting with ABs)</i>	
Accreditation (linear specifications)	Early-mid November
Accreditation (modular specifications)	December
First teaching	September 2007
First awards	Summer 2009

## **Results of the web-based consultation on the future of GCSE mathematics coursework**

### **Background**

The consultation set out options for change within the context of other changes in GCSE mathematics:

- September 2006 – introduction of a two-tier assessment model for GCSE mathematics, in place of the current three-tier, with the same mathematical content as at present. First examination 2008.
- September 2010 – two new GCSE specifications in mathematics. One of these will follow the key stage 4 programme of study, include functional mathematics and be taken by most students. It may contain internal assessment. First examination 2012.

In the light of these changes to GCSE, any change to coursework prior to 2010 resulting from this consultation will be applicable for a relatively short period: teaching from 2007 to summer 2011, leading to 2009–11 examinations. Teachers were advised that when responding, they should consider the relative advantages and disadvantages of making a change that will be in place for a relatively short period of time. They were told that a change to coursework arrangements would therefore only be recommended to Ministers if it were strongly supported by the consultation.

### **Current coursework requirements**

The current coursework element of GCSE mathematics accounts for 20% of total marks, equally distributed between two separate tasks:

- using and applying mathematics (10%)
- handling data (10%)

The topics themselves are both regarded as important aspects of mathematics at this level. There is, however, evidence that using and applying mathematics is considered more valuable in terms of assessing skills than the handling data exercise.

As both topics are part of the key stage 4 programme of study and are within all GCSE specifications, they will still need to be assessed in some other form if coursework is removed or reduced.

External assessment of the GCSE would need to include questions on any topics currently tested by coursework, and might be increased in length as a consequence. It also means that new sample assessment materials will be required.

## Outcomes of the consultation

The initial version of the consultation contained an error that prevented teachers from indicating the range of tiers that they taught, and they were forced to select a single option, an amended version was provided where teachers could choose all tiers that applied. Slightly under 50% of entries were affected by this and in these cases information provided about tiers was removed so that this error did not impact on analysis.

Total respondents: 1607

### Respondent by type:

<b>Respondent type</b>	<b>No</b>	<b>%</b>
Teacher – FE college	48	3.0
Teacher – 6th form college	31	1.9
Teacher – state selective school	173	10.8
Teacher – state non-selective school	707	44.0
Teacher – Independent selective school	130	8.1
Teacher – independent non-selective school	69	4.3
Manager – FE college	4	0.2
Manager – 6th form college	4	0.2
Manager – state selective school	38	2.4
Manager – state non-selective school	175	10.9
Manager – Independent selective school	55	3.4
Manager – independent non-selective school	18	1.1
Examiner – GCSE Mathematics	30	1.9
Other	125	7.8
<b>Total</b>	<b>1607</b>	<b>100.0</b>

<b>Main categories of 'others' responding</b>	<b>No</b>
Adviser/LA maths consultant	31
Consultant	16
Teacher – other establishment type	16
Head of Maths Dept	6
Head Teacher	5
Parent	5
Former teacher	4
Student	4
Former Student	3
Higher education mathematics	3
Tutor	3
Writer	2

### Teacher respondents – by centre type

Respondent type	No	%
Teacher – FE college	48	4.1
Teacher – 6th form college	31	2.7
Teacher – state selective school	173	14.9
Teacher – state non-selective school	707	61.1
Teacher – Independent selective school	130	11.2
Teacher – independent non-selective school	69	6.0
<b>Total</b>	<b>1158</b>	<b>100</b>

The respondents were an even mix of men and women (48.1% male, 50.2% female)

In response to the central questions there was a clear and substantial majority feeling that all coursework should be removed for both the 2007 and 2008 options, at around 70%, the actual figures are shown below.

If change was introduced for first teaching from 2007 do you think we should:

Option	Frequency	%
Keep all Coursework	99	6.2
Remove Handling Data	327	20.3
Remove all Coursework	1092	68.0
No response	89	5.5
	<b>1607</b>	<b>100</b>

If change was introduced for first teaching from 2008 do you think we should:

Option	Frequency	%
Keep all Coursework	91	5.7
Remove Handling Data	277	17.2
Remove all Coursework	1142	71.1
No response	97	6.0
	<b>1607</b>	<b>100</b>

The large majority of respondents (77.1%) felt that there were **not** areas of mathematics for which internal assessment/coursework was a better method of assessment than external examination.

The main questions were re-analysed to look at the effects of:

- Gender of respondent
- Type of school
- GCSE Mathematics tiers taught
- Gender of students taught

None of these factors significantly affected the pattern of the findings.

## Student questionnaire

In addition to this consultation, a special consultation was designed for students, using a direct mailing system, since trying to reach young people through web-based consultation is not efficient. Through its large scale monitoring programme in 2005 QCA contacted mathematics teachers in around one thousand schools for information about mathematics in the curriculum. Of these, 122 schools indicated that they were willing to be contacted by a researcher, 95 of them supplied email addresses.

An email was sent to the 95 contacts asking whether, if their year 11 mathematics students had completed or largely completed the coursework element of the GCSE, they would be willing to distribute a short questionnaire to the students asking for their views about coursework. There were 32 positive responses to this email, and these were sent copies of the students' questionnaires, together with pre-paid envelopes in early May 2006. Teachers were asked to distribute questionnaires to students in class, asking students to collect completed forms, seal them in the envelopes and return to QCA by post.

## Results of student questionnaire

2275 questionnaires from 21 schools were received by QCA and the data analysed.

Of the students responding, 44.4% were male and 55.2% were female.

In terms of the GCSE Mathematics tier that the students were entering, the distribution was as follows:

Tier	Frequency	%
Foundation	286	12.6
Intermediate	1021	44.9
Higher	953	41.9
Missing	15	0.7
<b>Total</b>	<b>2275</b>	<b>100</b>

89% of students responding reported that they had completed their using & applying mathematics coursework, and 87.5% reported that they had completed their handling data coursework. Further analysis showed that the Foundation tier students reported slightly lower rates of completion.

Overall, students were divided on the question of whether coursework was a good way to learn about mathematics, 51% reported that it was, 48% that it was not. When the results were analysed by tier this question showed the following variation in percentages:

Tier	Foundation	Intermediate	Higher
Yes	64.7	48.4	49.8
No	33.6	50	49.7
Missing	1.7	1.7	0.4
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

On the question of whether coursework was more enjoyable than other parts of the course the results were as follows:

Statement	Frequency	%
More enjoyable	523	23
Less enjoyable	959	42.2
The same	766	33.7
Missing	27	1.1
<b>Total</b>	<b>2275</b>	<b>100</b>

The following table shows these figures by tier:

Tier	Foundation	Intermediate	Higher
More enjoyable	29.4	24.9	19.4
Less enjoyable	30.8	40.5	46.8
Same	37.8	33.4	33.2
Missing	2.1	1.2	0.6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

When asked which was the best way to find out what students know in mathematics the results were as follows:

Statement	Frequency	%
Exam	1615	71
Coursework	609	26.8
Missing	51	2.2
<b>Total</b>	<b>2275</b>	<b>100</b>

The following table shows the percentages by tier:

Tier	Foundation	Intermediate	Higher
Exam	54.2	68.4	79.0
Coursework	42.3	29.7	19.3
Missing	3.5	2.0	1.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

The results were also examined by gender, which revealed a very similar pattern of results to the aggregate data, with no significant differences.

### Awarding bodies

The regulators met with awarding body subject officers and development managers a number of times during and after the consultation period. All supported the removal of coursework. The awarding bodies agreed to a timetable by which they would submit revised specifications and sample assessment materials for linear specifications to the regulators by the end of October 2007. Accreditation of the linear specifications would take place in November, of the modular specifications in December. This means that centres would have the revised specifications and sample assessment materials before the holiday break.

### Conclusion

The consultations carried out by QCA pointed in the same direction – a removal of mathematics coursework from GCSE as soon as practicable. The student response was more ambiguous than the teachers' – but even they overwhelmingly agreed that the best way to ascertain what students know about mathematics was by external

examination. These results verify the November 2005 QCA consultation on GCSE coursework.