



Department
for Education

Introduction of 16 to 18 core maths qualifications

Policy Statement

December 2013

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Introduction

The government has set out an ambition for the overwhelming majority of young people in England to study mathematics at least to age 18 by 2020. We lag behind our competitors internationally both in the proportion of students both studying maths to age 18 and in the proportion studying the subject to advanced levels¹, yet these skills are increasingly essential to higher education study², young people's future careers and the economy more generally³.

Current Situation

At the moment around 20 per cent of students who achieve grade C or above in GCSE maths at age 16 go on to gain AS or A level maths qualifications (13 per cent of all students). Over 80 per cent of these have an A* or A grade at GCSE⁴.

Students who have not achieved at least a GCSE grade C (36 per cent of the cohort in 2010)⁵ will in the future continue studying towards the qualification as part of their 16 to 19 education (this will be a condition of funding from September 2014).

The percentage of students with B and C grades at GCSE who continue with maths is far lower. Fewer than 10 per cent of students with a grade B and less than 1 per cent of those with a grade C go on to achieve AS or A level maths. Where students with a grade B or C choose to continue with maths beyond age 16, they often take lower level courses. For example, of the 24 per cent of grade C students who continued with maths after age 16, over three quarters did this at a lower level than they had already achieved⁶.

'Core Maths'

'Core Maths' policy focuses on the 40 per cent of students each year who do achieve a grade C or above at GCSE but who do not continue with any form of more advanced maths after age 16 – over 200,000 each year in total. The government is taking forward a range of measures to address the problem of poor take-up and progression in maths which include:

¹ Is the UK an outlier? Nuffield Foundation, July 2010.

² Mathematical Needs, ACME June 2011

³ See for example The Employment Equation: Why our young people need more maths for today's jobs, Sutton Trust, July 2013

⁴ DfE data for the cohort who were academic age 17 in 2011/12, so took GCSEs in 2009/10. Only includes those who were in the state sector at age 15

⁵ As above

⁶ As above

- Supporting the introduction of new qualifications at level 3 tailored to meet the needs of 16-18 year old students who have gained a C or higher at GCSE but do not have the opportunity or do not wish to take AS/A level maths;
- A programme of funding for teaching trials in schools and colleges to develop approaches to delivering and teaching these qualifications;
- A centrally-funded Core Maths Support Programme to help schools and colleges to introduce new qualifications by for example sharing effective teaching widely and providing support for the professional development of teachers and lecturers; and
- Performance measures for schools and colleges which recognise the proportion of students gaining level 3 maths qualifications, subject to the outcome of the Department's recent 16-19 Accountability consultation, which reports in the spring.

New Qualifications

The Department is using the term 'Core Maths' to refer to level 3 mathematical qualifications which are suitable for students with GCSE at grade C or above who do not progress into A level or AS maths. Alongside AS/A level maths and comparable IB maths certificates, new qualifications will count against a proposed level 3 maths school and college performance measure and the maths component of the TechBacc if they meet certain requirements.

Purpose

The purpose of Core Maths courses will be to develop students' mathematical understanding and application of maths in ways that are valuable for further study and employment across a range of areas. New qualifications will develop students' ability to think mathematically, logically and analytically and will build skills in applying maths to new problems and issues.

Core Maths courses will be distinct from A Level maths. The main purpose of the latter is to prepare students for higher level study with a significant mathematical focus, such as engineering, economics and the sciences. Core Maths will prepare students for further study and careers without such a mathematical focus but where mathematical knowledge and its application are nonetheless important, such as geography, business and the social sciences - though we recognise that some universities look for A level maths for these subjects.

Design

In October 2013, the Advisory Committee on Mathematics Education (ACME) published its expert panel report offering recommendations on a range of qualification characteristics. The Department is grateful for this valuable advice, which has informed discussions with Ofqual and with awarding organisations about new qualifications.

In spring 2014, we will publish technical guidance on the characteristics of qualifications that will count in performance measures. We set out below our policy position on requirements and expectations. By 'requirements' we mean characteristics we intend to include in technical guidance. By 'expectations' we indicate something that is not a requirement, but nonetheless may be helpful for awarding organisations to consider. On the basis of this statement will consult informally with awarding organisations, maths organisations and education sector representative bodies to inform the detailed technical guidance that will be published in the spring.

Characteristics

Size

New qualifications should fit alongside a student's main 16-18 programme and therefore Core Maths qualifications should be designed to be taken over two years. We expect that new qualifications will be around half the size of an A level. We will publish specific requirements on size following discussion with awarding organisations.

One of the main reasons for introducing new qualifications is to address the 16-18 'maths gap', whereby students often forget the maths they have learnt previously. For this reason we consider it important for students to study maths over the full two years and would expect qualifications to be delivered in this way.

Content

Core Maths content should focus on:

- the application of mathematical knowledge to address problems and questions;
- representing situations mathematically; and
- use of mathematical and statistical knowledge to make logical and reasoned arguments in a variety of contexts.

The higher tier of GCSE mathematics should be used freely in Core Maths courses. We will look for the approach to this to be set out in qualification content. The higher tier of *revised* GCSE content, published on 1 November 2013, should be reflected, including content for higher attaining students in bold. Whilst a broad range of this content should be reflected in new qualifications, we do not intend to set out detailed requirements at this stage.

All students should cover this content, but we also expect courses to include more challenging material, some of which may be optional - for example, the use of calculus.

Grading

To be included in school and college performance measures, we will require qualifications to be graded – that is, have a pass, merit, distinction structure or a more detailed scale. We welcome recent work by awarding organisations to arrive at a common approach to this.

External Assessment

Whilst it is important for assessment to address the application of maths to authentic problems, we do not consider that a significant element of internal assessment is necessary for this.

In order to ensure high confidence in Core Maths qualifications, we have taken into account Ofqual's regulatory view on internal and controlled assessments for GCSEs and A levels. In the light of this, we have come to a view that at least 80 per cent of the final grade of Core Maths qualifications should be determined through external assessment. This does not preclude the use of coursework or other non-examination methods that are assessed externally, though we will require the large majority of external assessment to be based on examination.

Synoptic Assessment

We consider it important for links to be made between different areas of mathematics used within contexts or situations, and that students should become aware of the interconnectivity of mathematical ideas.

We believe that this can only be achieved through the use of synoptic assessment to allow students to integrate and apply the skills, knowledge and understanding that they have learnt throughout the course with breadth and depth. We will therefore require synoptic assessment to be used for Core Maths qualifications.

Assessment Objectives

We set out an initial view on assessment objectives below. We have not come to a decision at this stage on whether specific requirements for assessment objectives will be set out for performance measures. We will discuss this question with Ofqual and awarding organisations before coming to a decision.

Our initial view is that:

- We agree with the expert panel that the greatest emphasis in assessment should be on the application of mathematical techniques and approaches to problems and situations, which we would anticipate will reflect the largest weighting in assessment;
- To ensure an appropriate level of challenge, this aspect should include some assessment of skills in mathematical analysis of complex contexts; critical mathematical skills such as selecting appropriate mathematical techniques to understand a new situation; and 'open' mathematical problem-solving, where there may not be a single approach or 'correct' answer; and

- Communication of mathematical approaches and solutions is critical, and we agree that this should be reflected in assessment at an appropriate level of challenge.

Ofqual will need to be satisfied that assessments are sufficiently demanding if Core Maths qualifications are to be accredited as level 3.

Other Considerations

Technology

The expert panel recommends that the content of Core Maths qualifications can be taught and learnt through the use of appropriate technology. Whilst we anticipate that new qualifications will reflect this advice, we will not make this a specific requirement for performance measures.

University and Employer Role

It is essential that Core Maths qualifications help prepare students for higher education and employment. Given both this and the need for Core Maths courses to focus on authentic contexts and mathematical problems, we will set a requirement for evidence to be provided by awarding organisations that qualifications have been designed with input from university academics and employers.

Outline Timetable

Phase 1 – Design and Development

- **January-February 2014:** Discussions with and feedback from awarding organisations, maths organisations and education sector representative bodies to inform Technical Guidance on characteristics of qualifications for inclusion in performance measures from 2017.
- **March 2014:** Confirmation of requirements and publication of Technical Guidance for 'Core Maths' qualifications.
- **January=July 2014:** Awarding organisations design and develop new qualifications.
- **By October 2014:** Qualifications accredited.

Phase 2 – Introduction and Trialling

- **April-July 2014:** Early adopter schools and colleges identified and individual plans agreed.
- **August-September 2014:** Outline qualification information available for schools and colleges
- **October 2014:** Qualifications available to schools for planning and 'early adopter' teaching.
- **July 2015:** Review of initial implementation – early teaching continues to June 2016 with awards in summer 2016.

Phase 3 – Consolidation

- **September 2015:** Qualifications introduced widely.
- **May-October 2016:** Review of teaching trials.
- **Summer 2017:** First assessments that will count towards level 3 maths performance measure.
- **September 2017:** First cohort with revised GCSE begins Core Maths.



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