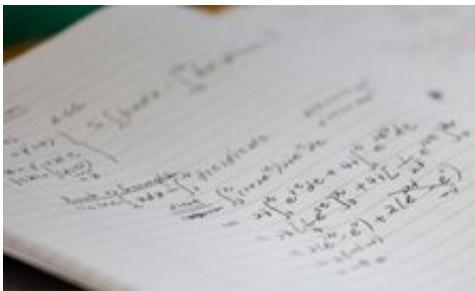


# New maths qualification needed to improve England's poor participation in maths post-16

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The solution to England's poor participation rate in post-16 maths education could lie in a new qualification that provides a clear and attractive alternative for students who don't currently go on to study maths at AS or A level, according to a study that compares maths education in seven countries. The study, led by Professor Jeremy Hodgen at King's College London and published by the Nuffield Foundation, makes recommendations in order to address the fact that only about 20 percent of students in England study maths after GCSE.

The authors of the report argue that the new qualification should focus on mathematical fluency, modelling and statistics and be built into requirements for [higher education](#) in order to encourage take-up. It should be developed in the context of the wider curriculum and

qualification framework, with consideration given to encouraging study of a broader range of subjects post-16.

In addition GCSE mathematics should remain compulsory until [students](#) have achieved a satisfactory grade – [as previously recommended by the Wolf Report](#) into vocational education – and consideration should be given to enabling some students to prepare for GCSE an additional year or more, rather than the current tendency towards early entry.

Only 20 percent of students in England study maths after GCSE, which is lower than other comparable countries, including Scotland – where 48 percent of students study maths post-16. In Germany and Hong Kong the figure is over 90 percent and Singapore, New Zealand and the USA all have participation rates over 65 percent.

## **What drives increased participation?**

The study suggests that high levels of participation are not simply driven by [compulsion](#), particularly for advanced mathematics. Other factors, such as providing appropriate options for all students and the breadth of the post-16 curriculum in general, are associated with high levels of participation.

Maths is compulsory in Germany and Hong Kong leading to near universal participation in at least basic mathematics. However, New Zealand and Singapore have the highest levels of participation in advanced mathematics (equivalent to AS level) of the countries surveyed, without making it compulsory at this level.

In Singapore participation has increased following a requirement for students to choose a contrasting subject equivalent in size to an AS level, so arts and humanities students must take a science or maths option and vice versa.

New Zealand has increased participation by offering students an alternative [maths](#) option focused on fluency, statistics and the application of mathematics. This contrasts with England where although other qualifications exist the only widely available option is AS and A level mathematics, which have a significant calculus component and may not be the most appropriate route for all students, particularly those going on to study disciplines such as biosciences, geography, or business and management, where fluency and statistics may be more relevant.

## **Can we learn from policy in other countries?**

Education systems are embedded within the specific cultural and political context of each country and the report highlights the risks of trying to transfer ideas from one country to another, particularly as the education system in England is unusually complex. However, some key features of successful policies could usefully be considered as part of the reform process in England.

Professor Jeremy Hodgen, from the Department of Education & Professional Studies at King's, said: 'Our study shows the importance of a consensual approach to policy development and implementation. Higher education and employers will need to be involved in the development of a new qualification if they are to value it and to make it an entry requirement.

'Schools and colleges may need to be incentivised to offer the new qualification to students, as well as to ensure that existing advanced qualifications maintain their levels of participation. And it's important not to underestimate the timescale necessary for change, particularly if we are to address the critical shortage of mathematics teachers.'

Josh Hillman, Director of Education at the Nuffield Foundation, said: 'While we should be careful of the danger of 'cherry-picking' policies

from other countries, the evidence from New Zealand shows that it is possible to increase participation by providing an alternative pathway, focused on statistics, that is widely recognised and valued by higher education and employers. We believe there is much to learn from the New Zealand model and hope it will inform the development of an attractive and valued qualification in this country.'

**More information:** Download a copy of the report: [Towards universal participation in post-16 mathematics: lessons from high-performing countries.](#)

Provided by King's College London

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