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Addressing GCSE maths resit failure: A new approach

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Post-16 GCSE resits

Each year over 600,000 state school students take GCSE maths at age 16. As with all GCSEs, the qualification is graded 9 to 1, with 9 being the highest grade. Grade 4 represents a 'standard pass' and the achievement of a Level 2 qualification, and a grade 5 or above represents a 'strong pass'. Of 16 year olds taking the qualification annually, 43% study the foundation tier qualification, which covers a subset of total content and is limited to grades 1 to 5, with the rest studying higher tier, offering more challenging content designed for grades 4 to 9.



Annually, around 30% of 16 year-olds fail to achieve a standard pass in maths (and the same for English). This percentage is more or less the same every year and equates to around 180,000 students.

Full-time 16 to 18 year-old students who have not achieved grade 4 or higher in GCSE maths and English must continue studying these subjects as a condition of funding. Those who achieve a grade 3 are required to retake the GCSE¹. Those with grade 2 or below can study Functional Skills² at Level 1 or Level 2, but most resit the GCSE.

'English and maths GCSE are fundamental to young people's employment and education prospects'³, so it comes as no surprise that most enter the GCSE. But, while there has been improvement in pass rates, still fewer than half of students with a grade 3 at age 16 achieve a GCSE pass in maths by age 19, and just one quarter of all students without a standard pass go on to achieve a GCSE maths qualification.



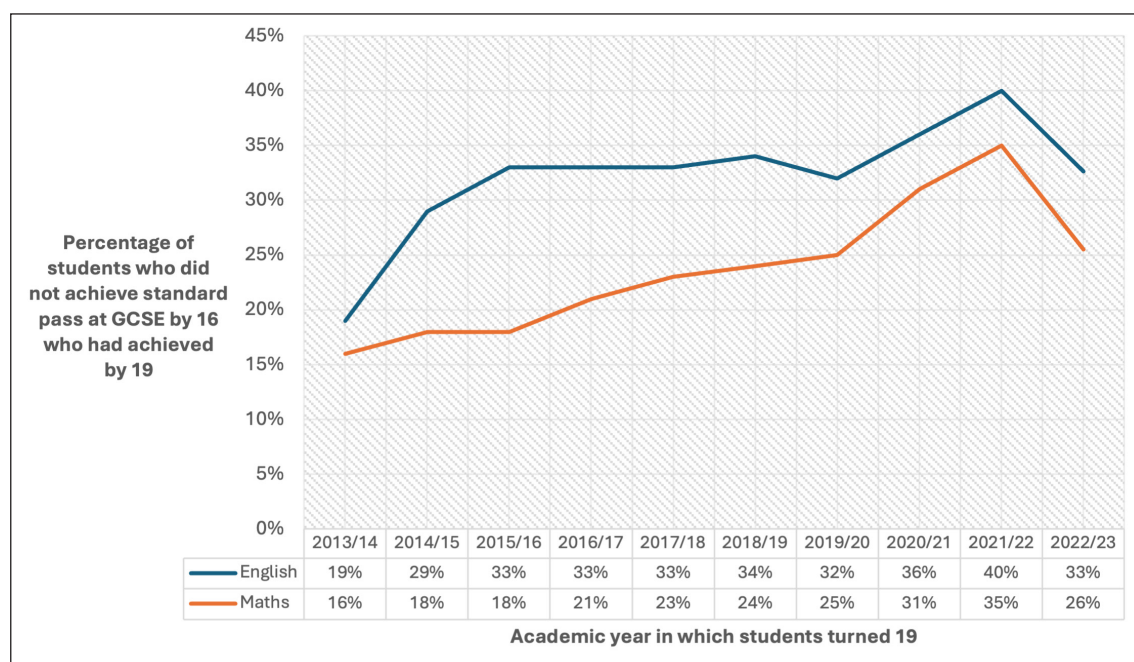
1 Education and Skills Funding Agency (2023). [Guidance: 16 to 19 funding: maths and English condition of funding](#)

2 Functional Skills are applied qualifications at level 2 or below widely used in apprenticeships. <https://qips.ucas.com/qip/functional-skills>

3 Wolf, A. (2011). [Review of Vocational Education – The Wolf Report](#)

Success and failure rates

Success rates by age 19 for students without a standard pass are outlined below⁴. Grading standards in 2020, 2021 and 2022 were eased due to the Covid-19 pandemic; 2018/19 and 2022/23 therefore present a more typical picture – one of under-achievement in maths. While success rates have improved, they remain low and fall below those of English.



Success rates in GCSE maths resit for students by prior grade are:

Grade at 16	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
3	33%	35%	33%	39%	42%	44%	46%	56%	64%	45%
2	9%	11%	12%	14%	13%	13%	17%	22%	24%	13%
1	2%	3%	3%	5%	4%	5%	5%	6%	5%	3%
U	3%	4%	4%	3%	4%	4%	6%	9%	6%	3%

⁴ <https://explore-education-statistics.service.gov.uk/data-tables/level-2-and-3-attainment-by-young-people-aged-19>

The case for a new approach

Large numbers of students capable of achieving GCSE maths by age 19 are failing to achieve the qualification, with education gaps widening as a result. The Education Policy Institute (EPI) identified that the 'absolute gap' in GCSE performance (the percentage point difference between progress rates of students eligible for FSM⁵ and non-FSM students in post-16 education) has increased over the period of the policy⁶. EPI concluded that we need a better alternative.

There have been several calls for a new approach: ASCL's work on 'The Forgotten Third', published in 2019⁷ recommended a competency-based 'Passport' in maths; and in 2022, MEI proposed a qualification at age 16 to assess the 'essential maths' that all students need as a foundation for further study and use of maths in everyday life.

The content of foundation tier GCSE Mathematics has a large overlap with what would reasonably be considered 'essential maths'. Students need to achieve mastery of this to form a solid foundation for further study of mathematics, and to use basic mathematics in everyday life.⁸

More recently, AQA recommended digital, on-demand assessments of numeracy, literacy and digital fluency taken when students are ready between ages 14 and 19⁹, pointing out that being a strong mathematician is not the same as having strong numeracy:

Someone who is proficient at calculus or trigonometry is not necessarily confident in working out common numeracy problems they will be faced with on a daily basis.



⁵ Students eligible for free school meals.

⁶ <https://epi.org.uk/publications-and-research/blog-time-for-a-resit-reset>

⁷ <https://www.ascl.org.uk/Our-view/Campaigns/The-Forgotten-Third>

⁸ <https://mei.org.uk/curriculum-and-assessment-in-mathematics-in-england-at-ks4-and-ks5-position-paper>

⁹ AQA (2023) "A, B, C, it's as easy as 1, 2, 3" <https://filestore.aqa.org.uk/content/about-us/education-policy/AQA-TOWARDS-NEW-ASSESSMENTS-NLD.PDF>

A redesigned post-16 maths GCSE qualification

We make the case for a rigorous qualification better suited to the needs of resit students – a new post-16 maths GCSE which:

- Reflects the numeracy, quantitative and mathematical skills needed for work and life - a subset of GCSE foundation tier, with additions such as financial applications and use of spreadsheets.
- Is of an equivalent standard to GCSE and incorporates the 'GCSE' name to ensure it is understood clearly by stakeholders including employers and students.
- Has a stepping-stone assessment which can be taken before the final two papers to assess essential skills - passing this element could be a prerequisite for entering the final assessment and would support progress by providing diagnostic information.
- Is limited to grades 1 to 5 in the same way as the foundation tier taken by nearly all resit students.

For some students, resitting the previous GCSE qualification is more appropriate, but the needs of the large majority are better served by the post-16 GCSE maths qualification.

As well as grade 3 students, the qualification would be designed to enable students with lower grades to progress to the qualification if ready. SEN students face heightened challenges within this group and, with careful design, their needs could be better met through a more scaffolded approach to progression.



Qualification content and assessment

In 2019, the Nuffield Foundation funded MEI to develop this new maths GCSE curriculum, to establish the principle of an alternative approach and serve as a catalyst for qualification change.

MEI's work was informed by reviews of national and international evidence. The report from the project, draft curriculum, exemplar examination papers and example teaching resources have been made available online¹⁰. Content is organised in four areas and set out in more detail in MEI's draft curriculum document. Sample assessment can be found in the main report¹¹.

<p style="text-align: center;">Financial understanding</p> <ul style="list-style-type: none"> • Understanding discounts in the sales • Understanding household bills • Estimating the cost of weekly food shopping • Splitting a restaurant bill • Shopping around for the best mobile phone deal • Comparing prices for differently sized packages • Budgeting for a holiday or major purchase • Personal budgeting • Managing a budget at work • Understanding interest rates when saving and borrowing 	<p style="text-align: center;">Working with measures and shape</p> <ul style="list-style-type: none"> • Being able to read a measuring scale • Knowing your height and weight • Converting between imperial and metric units • Buying enough paint to decorate a room • Using shapes in designing a garden or craft project • Making and interpreting measurements to decide whether a piece of furniture or household appliance will fit in a given space • Understanding a map or scale drawing • Understanding measurements relating to personal fitness and health • Giving the right quantity of medicine to children
<p style="text-align: center;">Planning activities</p> <ul style="list-style-type: none"> • Estimating time needed for tasks • Planning a schedule • Understanding staff shifts on a rota • Planning a meal or party for a large number of people • Giving and following directions • Understanding journey times • Understanding a map or scale drawing • Understanding timetables 	<p style="text-align: center;">Understanding quantitative information</p> <ul style="list-style-type: none"> • Recording numerical information accurately so others can understand • Making sense of statistics in the news • Interpreting the results of an opinion poll and understanding why different polls may produce different results • Understanding results of elections • Understanding food labels • Understanding statistics relating to personal fitness and health • Understanding risk in relation to health

¹⁰ <https://www.nuffieldfoundation.org/project/a-new-mathematics-gcse-curriculum-for-post-16-resit-students>

¹¹ <https://www.nuffieldfoundation.org/wp-content/uploads/2020/01/MEI-Draft-Curric-Maths-GCSE-post16.pdf>

As with the current GCSE, assessment would be exam-based, taken under controlled exam conditions, and externally marked. It comprises:

Paper 1: focused on numeracy and quantitative skills, available to be taken before the other two papers. This is a multiple choice paper, which could be computer-based. It will have a higher pass mark than standard GCSE papers, and could be taken more than once. It also provides feedback to centres for diagnostic purposes. One option is for this to lead to a recognised 'Essential Maths' certificate

Papers 2 and 3: Final assessments similar to current GCSE but with an applied focus.

Comparability with the current GCSE

No More Marking¹² are national experts in the use of comparative judgement in assessment¹³. They conducted an exercise to compare the difficulty of the exemplar papers for the proposed qualification with the summer 2017 GCSE (9 to 1) maths assessments and with AQA Functional Skills level 2 maths specimen papers¹⁴.

The comparative judgement found that the difficulty of exemplar Papers 2 and 3 for the new curriculum was fully in line with foundation tier GCSE maths.

Paper 1 was easier than foundation tier GCSE maths papers, in line with its design as a diagnostic paper to be taken early in the course to check whether students have the numeracy and quantitative skills in place to succeed in the rest of the course; students would be expected to gain higher marks on this paper than in GCSE.



Proposals for taking the qualification forward

To develop and introduce the qualification for post-16 students, three things need to happen:

- Acceptance by Ofqual that the qualification can be classified as a 'GCSE', in light of conditions and requirements for GCSEs.
- A change of funding rules to enable programmes for resit students taking the qualification to be funded.
- Provision of support and guidance to centres to introduce and teach the qualification.

We set out further information, including challenges and potential solutions below.

¹² <https://www.nomoremarking.com>

¹³ No More Marking was used by Ofqual to compare GCSE (9 to 1) Mathematics papers; see [GCSE maths: Final research report and regulatory summary](#) (2015).

¹⁴ Barmby, P., & Wheadon, C. (2019). A comparative judgement study of MEI GCSE exam items. No More Marking Ltd.

'GCSE' classification and regulation

We regard it as essential for stakeholders to understand any new qualification as equivalent to a GCSE in order to gain traction. As currently designed, though the proposed qualification is the same size as GCSE maths and with much of the same content, it would not meet GCSE conditions due to lack of Key Stage 4 curriculum fit, absence of a higher tier and the design of the assessment.



It is unlikely that Ofqual's GCSE conditions will be revised, as this has wide reaching implications. An alternative approach is to treat the GCSE in a similar way to iGCSEs – GCSEs taken internationally and by many independent schools in England. iGCSEs do not need to meet Ofqual's rules but are self-regulated by exam boards and recognised as equivalent to GCSE by universities and employers.

A new class of 'aGCSE' (standing for Adult GCSE) is a potential way forward. This type of qualification would be for post-16 and adult students only and not constrained by the requirements of the Key Stage 4 national curriculum.

Qualification development and piloting

The DfE would need to work with Ofqual and exam boards to bring the qualification to fruition through the development of qualification specification(s) and piloting. The pilot would ensure the qualification works as intended and would provide feedback that can be acted upon in a national rollout. This is likely to take a minimum of two years.

Support and guidance to schools and colleges

Schools and colleges receive support to teach maths qualifications in the form of government-funded teacher professional development programmes. The proposed qualification includes new material and the use of technology, and it is important that those teaching it are fully equipped to teach confidently in a way that promotes student confidence and understanding. A similar programme would be needed in advance of teaching the new qualification.

16-19 Condition of Funding

Changes would be needed to funding policy for resit students, to amend the EFA guidance on 16 to 19 funding to include the new qualification in its list of allowed qualifications for the maths and English condition of funding.

About MEI

MEI is an educational charity that transforms lives through maths education. We provide educational support and tools to inspire and develop mathematical proficiency and foster opportunities for all. We work with schools, colleges and teachers to provide students with the best possible maths learning experiences.

MEI runs the Advanced Maths Support Programme (AMSP)¹⁵ and is a leading partner in the National Centre for Excellence in the Teaching of Mathematics (NCETM)¹⁶.

In FE, MEI runs an extensive programme of professional development funded by the Department for Education for GCSE maths resit teachers and leaders of maths in FE colleges¹⁷. We also run an in-person annual national FE Maths Challenge for post-16 students working towards GCSE and Functional Skills qualifications which attracts over 30,000 students annually¹⁸.

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¹⁵ <https://amsp.org.uk>

¹⁶ <https://mei.org.uk/about-me/what-we-do/current-projects-and-programmes/ncetm>

¹⁷ <https://mei.org.uk/teachers/functional-skills-gcse-resit/fe-maths-cpd-programme>

¹⁸ <https://mei.org.uk/teachers/functional-skills-gcse-resit/inspiring-students/further-education-maths-challenge>

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