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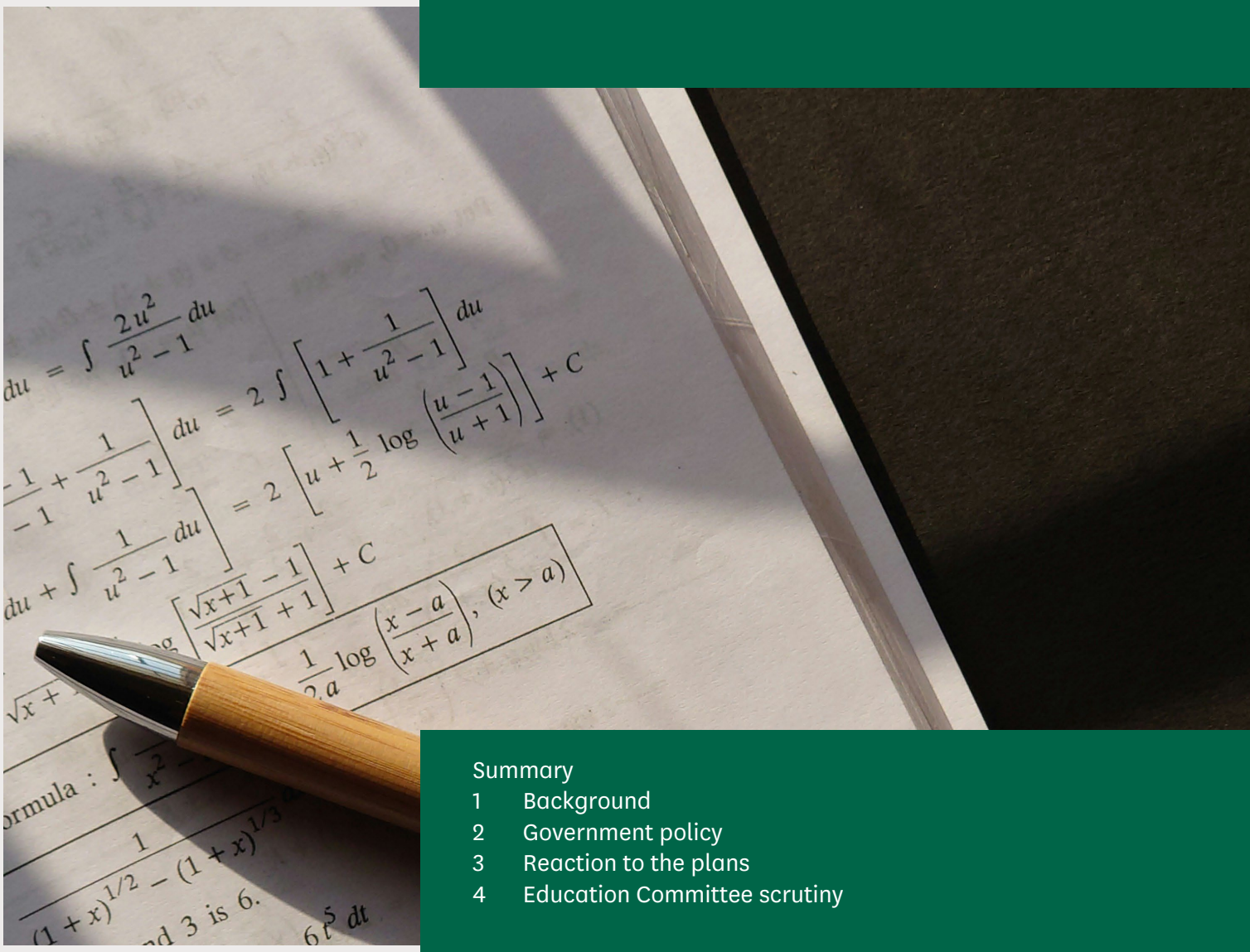
'Maths to 18' in England



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Summary

On 4 January 2023, Prime Minister Rishi Sunak set out his priorities for 2023 and announced all children and young people will study maths in some form to 18.

On 17 April 2023, the Prime Minister made a speech on improving maths attainment, in which he argued poor numeracy was socially acceptable and maths needed to be made more accessible so children did not fear it. The Prime Minister committed to:

- A new advisory group to advise on the 'maths to 18' plan
- The expansion of 'Maths Hubs' across England
- A new professional qualification for those teaching maths in primary schools

Rishi Sunak has confirmed the reforms associated with these interventions are unlikely to be implemented fully until at least the end of the current parliament (2025).

In October 2023, the Prime Minister announced the 'Advanced British Standard' would replace current post-16 qualifications and include maths in some form for all students.

Government policy

Expert advisory group

As part of his ambition for all children to study maths until 18, Prime Minister Rishi Sunak announced in April 2023 the establishment of a new advisory group of mathematicians, education leaders, and business representatives to advise the Government on "the core maths content that students need to succeed in future".

According to the group's terms of reference (PDF), between April and July 2023, the advisory panel collected and examined evidence from countries with high numeracy rates and employers across England. It was also expected to offer advice on the potential for a new maths qualification for people aged 16 to 18.

Maths Hubs

In July 2014, Maths Hubs were launched across England by the Coalition Government. The current network of 40 Maths Hubs supports schools and colleges to improve maths education. It is coordinated by the National Centre for Excellence in the Teaching of Mathematics.

The approach to maths across Maths Hubs is 'teaching for mastery'. There are several principles that underpin this approach, including ensuring teachers can continually develop their specialist knowledge for teaching maths and designing a curriculum with coherent and detailed content that supports sustained progression over time.

The Government has committed to extending the Maths Hubs Teaching for Mastery programme to 75% of primary schools and 65% of secondary schools by 2025.

Advanced British Standard

On 4 October 2023, Rishi Sunak announced the 'Advanced British Standard' at the Conservative Party Conference.

A Department for Education policy paper explained the Advanced British Standard would be "a new Baccalaureate-style qualification that takes the best of A levels and T levels and brings them together into a single qualification." The Advanced British Standard would consist of:

- A common core in which all students would study English and maths at an appropriate level and depth.
- A choice of academic and technical subjects that come in different sizes. This would be a mix of bigger and smaller subjects, called 'majors' and 'minors', with students typically doing three major subjects and two minor subjects.
- Non-qualification time which would include enrichment, pastoral, and employability activities for all students, and an industry placement where relevant.

Maths will be available at different levels and depths with a clear minimum expectation for all students at age 16. This will be done by ensuring one of a student's subjects include maths to at least minor level.

The Government has said it will take around a decade to implement the Advanced British Standard fully. It will launch a formal consultation on the approach and design of the new qualification in autumn 2023. This will inform a White Paper due to be published in 2024.

Funding

To achieve the aims of the Advanced British Standard, the Department for Education October 2023 policy paper set out associated funding of £600 million over two years. Much of this funding was focussed on maths and boosting teacher recruitment and retention, including:

- An additional £60 million of funding to expand the reach of Maths Hubs, increase the Core Maths and Advanced Maths Premium, and invest in a digital platform for tutoring in Core Maths.
- An investment of around £100 million a year to provide a tax-free bonus of up to £6,000 a year to teachers in the first five years of their career who are teaching "key shortage subjects", including maths, and working in disadvantaged schools and all further education colleges.
- An additional £150 million each year to increase investment for students retaking English and maths GCSEs, as well as for apprentices who have not gained their level 2 qualification in these subjects.

Reaction and issues

Much of the reaction to the Government's plans for extending maths to 18 focused on how this ambition could be undermined by a shortage of specialist maths teachers. Responding to the Prime Minister's April 2023 speech, Labour's Shadow Education Secretary Bridget Phillipson said:

> Once again, the prime minister needs to show his working: he cannot deliver this reheated, empty pledge without more maths teachers. But after 13 years of failing our children, the Tory government repeatedly misses their target for new maths teachers, with maths attainment gaps widening and existing teachers leaving in their droves.

Similarly, the Liberal Democrats' education spokesperson, Munira Wilson, described the plan as an "empty promise" until teacher recruitment and retention is addressed by the Government. The Joint General Secretary of the National Education Union, Mary Bousted, argued although "a laudable aim", the "workforce crisis in education" meant the plan was unworkable.

Other criticism came from the Association of Colleges chief executive, David Hughes, who said the focus on ages 16 to 18 was "short-sighted" and action was needed to improve numeracy from early ages through to 16.

The General Secretary of the Association of School and College Leaders (ASCL), Geoff Barton, criticised the Prime Minister for not consulting with school and college leaders ahead of his initial announcement and questioned the rationale for the plan, since A Level Maths is the most popular A Level choice for students and students who do not achieve at least a Grade 4/C in

GCSE maths are already required to continue to study either functional skills or GCSE maths during their post-16 courses.

Education Committee scrutiny

The House of Commons Education Committee considered the Government's plans for Maths to 18 in an evidence session in February 2023 and an accountability session with the then-Schools Minister Nick Gibb in July 2023. In both sessions the committee raised concerns about the lack of specialist maths teachers, pupils' enjoyment of maths, and the issue of persistent maths GCSE resits.

In April 2023, the Commons Education Committee published a report on the future of post-16 qualifications and how effectively they prepare young people for the world of work. The report noted England was unusual among comparative economies for not requiring the study of maths beyond 16 and said there were good reasons for introducing such a requirement, both for individuals and the economy. However, it also said making maths compulsory up to age 18 would present significant challenges in recruiting sufficient maths teachers.

The issue of maths teacher supply has also featured in the Education Committee's inquiry into teacher recruitment, training, and retention.

1 Background

1.1 The national curriculum and maths (age 5 to 16)

According to Government guidance, the national curriculum aims to ensure that all pupils:

- become fluent in the fundamentals of maths so pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- can reason mathematically by following a line of enquiry, and an argument with justification or proof using mathematical language.
- can solve problems by applying their maths to a variety of routine and non-routine problems with increasing sophistication.[1]

Primary

The principal focus of mathematics teaching in key stage 1 (pupils aged approximately 5- to 7-years-old) is to ensure that pupils develop confidence and mental fluency with whole numbers, counting, and place value. This should involve working with numerals, words, and the four operations (addition, subtraction, multiplication, and division), including with practical resources.

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

The principal focus of mathematics teaching in upper key stage 2 (ending at age around 11) is to ensure pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages, and ratio.[2]

1 Department for Education, National curriculum in England: mathematics programmes of study, updated 28 September 2021

2 Department for Education, National curriculum in England: mathematics programmes of study, updated 28 September 2021

Secondary

The programme of study for key stage 3 (ages approximately 11 to 14) is organised into distinct areas, but pupils should build on key stage 2 and connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge in science, geography, computing, and other subjects.

Decisions about progression should be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered sophisticated problems before any acceleration through new content in preparation for key stage 4. Those who are not sufficiently fluent should consolidate their understanding, including through additional practice, before moving on.

Together, the mathematical content set out in the key stage 3 and key stage 4 programmes of study covers the full range of material contained in the GCSE Mathematics qualification. Wherever it is appropriate, given pupils' security of understanding and readiness to progress, pupils should be taught the full content set out in this programme of study.[3]

See the Commons Library briefing paper Comparing the school curriculum across the UK for more information.

1.2 Current post-16 maths options

Current post-16 options for studying maths include:

- A Levels in maths, further maths, and statistics
- Core maths qualifications. Core maths is an umbrella term covering a number of qualifications offered by awarding organisations for students who achieve a 9 to 4 (A* to C) at GCSE but who do not study AS/A Level maths. All offer the opportunity for students to build their knowledge to a higher level, with a focus on the use and application of maths and statistics.
- International Baccalaureate Diploma Programme (IBDP) maths certificates. IBDP students complete assessments in six subjects and three core requirements, the latter of which includes maths at level 3.

Government policy in England requires full-time students aged 16 to 18 who have not achieved grade 4 (a standard pass, or 'C' under the old system) or

[3] Department for Education, National curriculum in England: mathematics programmes of study, updated 28 September 2021

higher in GCSE Mathematics at 16 to continue studying maths. This is a condition of school and college funding for students aged 16-19.[4]

As an alternative to resitting GCSE maths, or alongside an apprenticeship, some pupils will take a functional maths qualification, which aims to teach the numeracy skills needed in daily life and the workplace.[5]

1.3 The Multiply adult numeracy programme

In October 2021, the Government announced the Multiply programme. This programme was launched in spring 2022 with the aim of improving adult numeracy skills across the UK through "bespoke adult numeracy programmes".[6]

The Multiply programme is for:

- Adults who do not have a GCSE grade C/4 or higher in maths to provide the "ability to understand and use maths in daily life, home, and work."
- Employers who want to improve the skills of their staff through "Maths GCSEs or work-ready Functional Skills Qualifications and design and deliver bespoke programmes for their workforce – at no cost to them."[7]

Contextualising the maths to 18 proposal in January 2023, Prime Minister Rishi Sunak said, "As Chancellor, I introduced Multiply, a new programme to give hundreds of thousands of adults the opportunity to get the basic numerical skills they need".[8]

However, the rollout of this programme has been delayed, inconsistent, and incomplete. In April 2023, FE News reported local authorities who applied for funding in the summer of 2022 only received funding in December 2022, which led to the Government agreeing that underspend for the 2022-23 financial year could be carried forward to 2023-24.[9]

The initial announcement of Multiply included an online digital platform set to be launched in 2022. It was said this platform would give access to online numeracy training on demand, so learners could train flexibly. This platform would also signpost to any new courses in the local areas and provide an

4 Education and Skills Funding Agency, 16 to 19 funding: maths and English condition of funding, 22 June 2023; See Commons Library briefing CBP-9834, Comparing the school curriculum across the UK
5 National Numeracy, Functional Skills: What are they?
6 Department for Education Hub blog, Everything you need to know about the new Multiply programme, 27 October 2021
7 Department for Education Hub blog, Everything you need to know about the new Multiply programme, 27 October 2021
8 Prime Minister's Office, PM speech on building a better future, 4 January 2023
9 "Multiply – The maths scheme that doesn't yet add up", 25 April 2023

assessment of existing numeracy skills.[10] In April 2023, the Guardian reported plans for this platform have been put on hold by the Department for Education.[11] When asked for an update on the Multiply programme by the Education Committee in July 2023, the Minister for Schools said there would be a review and announcement "shortly".[12]

More information about the Multiply programme can be found on the Skills For Life website.

1.4 Attainment in maths

In January 2020, the maths charity Mathematics in Education and Industry published a report that argued the examination system often leads to reduced confidence in young people, with low expectations of success.[13] It said:

> These negative attitudes can be transmitted to their families and others and may last a lifetime. Much effort and money is being spent on a system that gives many young people a negative experience of mathematics education that is detrimental to them as individuals and to our society as a whole.[14]

The report in particular focussed on the value of post-16 students resitting the maths GCSE, saying "GCSE Mathematics does not address the needs of the large majority of students who currently resit it."[15] It proposed an alternative maths qualification for this group of students, which focusses on everyday life and work.

Primary

At primary level, attainment is measured at Key Stage 1 (age 5 to 7) and Key Stage 2 (age 7 to 11).

Key stage 1

According to government statistics, attainment at Key Stage 1 has increased in all subjects compared to 2021/22, but it is still lower than 2018/19.

In 2022/23, 71% of pupils met the expected standard in maths, up from 68% in 2021/22 but still lower than 76% in 2018/19. Among reading, writing, and

10 "DfE to spend over £100m on digital platform for Multiply maths scheme", FE Week, 19 April 2022
11 "DfE quietly shelves plans for £100m online adult learning platform", The Guardian, 25 April 2023
12 Education Committee oral evidence: Government plans for maths to age 18 and school funding, 18 July 2023
13 Mathematics Education Innovation, A new maths GCSE curriculum for post-16 resit students, 24 January 2020
14 Mathematics Education Innovation, A new maths GCSE curriculum for post-16 resit students, 24 January 2020, p1
15 Mathematics Education Innovation, A new maths GCSE curriculum for post-16 resit students, 24 January 2020, pV

maths, attainment at the expected standard remains highest in maths and lowest in writing. 16% of pupils met the higher standard in maths in 2022/23, marginally increased from 15% in 2021/22 but still lower than 22% in 2018/19.[16]

Key stage 2

At key stage 2, 73% of pupils met the expected standard in maths in 2022/23, up from 71% in 2021/22. In 2022/23, attainment in all of reading, writing, and maths (combined) remained the same as 2022.[17]

Secondary and post-16

GCSE

In 2022/23, 72% of all school pupils in England achieved a grade 4 or above in GCSE maths.[18]

Post-16

In 2022/23, 73% of pupils taking A level Mathematics achieved a grade A*-C, this is a decrease of 3.7 percentage points (from 76.7%) compared to 2021/22.[19]

In Further Mathematics in 2021/22, 91.1% achieved a grade A*-C. This is an increase of 5.8 percentage points (from 85.3%) compared to 2018/19.[20] These are the latest statistics at the time of writing.

Adult maths/numeracy skills

The Department for Education has said there are eight million adults with the maths skills of a nine year old.[21]

The maths charity National Numeracy has said low levels of numeracy (defined as below level 2 on the UK adult qualifications scale, which is equivalent to GCSE grades 9 to 4 / A* to C) are a long term and worsening problem for UK.[22]

16 Key stage 1 and phonics screening check attainment, Academic Year 2022/23, 12 October 2023
17 Key stage 2 attainment: national headlines, Academic Year 2022/23, 11 July 2023
18 Key stage 4 performance 2022/23, 19 October 2023
19 A level and other 16 to 18 results, 2021/22, 2 February 2023
20 A level and other 16 to 18 results, 2021/22, 2 February 2023
21 Department for Education Hub blog, Studying maths to 18 – what you need to know, 4 January 2023
22 National Numeracy, What is the issue?

1.5 Workforce capacity

While the Department for Education publishes teacher retention statistics on an annual basis, it does not provide a breakdown by subject, so data about the retention of maths specialists is difficult to attain.

The annual survey for 2022, published in June 2023, showed there were 7,800 more leavers than 2021 in 2021/22. The number of teacher vacancies increased from around 1,600 in November 2021 to around 2,300 in November 2022.[23]

The vacancy rate (which takes into account the fact the workforce has also increased in this period) has also increased, from 2 per 1,000 teachers in service to 5 per 1,000. The number of temporarily filled posts have also increased from around 2,200 to around 3,300, and the temporarily filled rate has also increased between 2021 and 2022, suggesting short-term solutions are being sought.

Independent schools, non-maintained special schools, sixth-form colleges and further education establishments are not included in this data.

[23] Reporting year 2022, School workforce in England, 8 June 2023

2 Government policy

On 4 January 2023, Prime Minister Rishi Sunak announced that all children and young people will study maths in some form to 18. He said while this did not mean everyone would study A Level maths, numeracy would be a "central objective" of the education system.[24]

The Prime Minister made a second speech on 17 April 2023 linking economic growth with a focus on numeracy.[25] He argued it was a "cultural issue" that enabled poor numeracy to be "socially acceptable", and maths needed to be made "more accessible, [for] building our children's confidence, so they don't fear maths." The speech included commitments to:

- extend Maths Hubs, which are schools partnerships that support maths teaching;
- a new fully funded professional qualification for those that are teaching maths;
- a "new expert group", who will identify the core maths content 16- to 18-year-olds need and explore the need for "a new specific qualification to support that."[26]

Rishi Sunak has confirmed the reforms associated with these interventions are unlikely to be implemented fully until at least the end of the current parliament (2025).[27]

The Department for Education has said it will not make mathematics A Level compulsory. In response to a written parliamentary question tabled on 6 January 2023, the Minister of State for Schools, Nick Gibb, said:

> The Department does not envisage making a mathematics A level compulsory for all 16-year-olds. The Department is exploring a range of options, including existing routes, such as Core Mathematics qualifications, T Levels, as well as other options. Further detail will be set out in due course.[2]

24 Prime Minister's Office, PM speech on building a better future, 4 January 2023
25 Prime Minister's Office, PM speech on improving attainment in mathematics, 17 April 2023
26 Prime Minister's Office, PM speech on improving attainment in mathematics, 17 April 2023
27 Prime Minister's Office, PM speech on building a better future, 4 January 2023 "Sunak outlines maths to 18 'ambition'...but not before 2025", Schools Week, 3 January 2023

2.1 Expert advisory group on Maths to 18

As part of his ambition for all children to study maths until 18, Prime Minister Rishi Sunak announced the establishment of a new advisory group of mathematicians, education leaders, and business representatives to advise the Government on "the core maths content that students need to succeed in future".[28]

The membership of the advisory group is a mix of stakeholders from education and industry:

- Dr Maggie Aderin-Pocock, chancellor, University of Leicester
- Peter Cooper, executive principal and CEO, Heart of Mercia Multi-Academy Trust
- Lucy-Marie Hagues, CEO, Capital One UK
- Professor Jeremy Hodgen, professor of mathematics educations, University College London
- Simon Lebus, non-executive chairman, Sparx
- Tim Oates, group director of assessment research and development, Cambridge University Press and Assessment
- Charlie Stripp, CEO, MEI and director, National Centre for Excellence in Teaching of Mathematics (NCETM)
- Fionnuala Swann, assistant principal (academic), Nelson and Colne College Group.[29]

According to the group's terms of reference (PDF), between April and July 2023, the advisory panel collected and examined evidence from countries with high numeracy rates and employers across England.[30] It was also expected to offer advice on the potential for a new maths qualification for people aged 16-18.

The panel has explored what maths knowledge and skills are needed for jobs in the modern economy, and therefore what maths content should look like in a post-16 education system in which all young people will study "meaningful maths to age 18". The intention is that any subsequent government policy decisions would ensure "any young person, regardless of their chosen

28 Prime Minister's Office, Prime Minister outlines his vision for Maths to 18, 17 April 2023

29 Department for Education, Expert Advisory Group on Maths to 18: Terms of Reference (PDF), April 2023, p3

30 Department for Education, Expert Advisory Group on Maths to 18: Terms of Reference (PDF), April 2023

pathway, will experience high-quality maths education that is world class and suited to their needs".[31]

One of the major challenges to implementing maths to 18 is workforce capacity, as highlighted in August 2023 by expert panel member Tim Oates when updating the Westminster Education Forum and Times Education Supplement on the group's findings.[32] He said the workforce does not currently exist to deliver the ambition for all learners, and recruitment and retention strategies for maths specialists, or effective continuing professional development (CPD) for teachers in other subjects to upskill them in maths specialism, were needed to address the shortage of specialist maths teachers.

In November 2023, Schools Week reported that the National Centre for Excellence in the Teaching of Mathematics (NCETM) had met 57% of its target for training non-specialist maths teachers.[33]

2.2 Maths Hubs

In July 2014, Maths Hubs were launched across England by the Coalition Government.[34] The Maths Hubs programme supports schools and colleges to improve maths education. These Hubs are mainly funded by the Department for Education, but other organisations sometimes sponsor specific programmes.

With funding from the Department for Education, the network of 40 Maths Hubs is coordinated by the National Centre for Excellence in the Teaching of Mathematics (NCETM), which has created a national network of hubs comprising schools, colleges, and further education colleges. As of November 2023, there are 40 Maths Hubs across England.[35]

The approach to maths across Maths Hubs is 'teaching for mastery'. There are several principles that underpin mathematical teaching for mastery, including:

- Assuming everyone can learn and enjoy mathematics.

31 Department for Education, Expert Advisory Group on Maths to 18: Terms of Reference (PDF), April 2023, p1

32 Westminster Education Forum, Next steps for post-16 maths in England – implementing maths to 18, August 2023; Tes magazine, Maths to 18: CPD for non-maths teachers needed, 11 August 2023

33 "Maths skilling-up scheme for non-specialists fall short"; Schools week. 10 November 2023

34 Department for Education, Network of 32 maths hubs across England aims to raise standards, 1 July 2014

35 National Centre for Excellence in the Teaching of Mathematics, Current Maths Hubs

- Working to develop mathematical learning behaviours so pupils can focus and engage fully, allowing them to reason mathematically and seek to make connections.
- Ensuring teachers can continually develop their specialist knowledge for teaching maths, working collaboratively to refine and improve their teaching.
- Designing a curriculum with a coherent and detailed sequence of content that support sustained progression over time.[36]

These principles inform lesson designs and the teaching of maths in classrooms. For example, the use of precise mathematical language is encouraged to allow pupils to communicate their reasoning and thinking effectively. More information about mathematical teaching for mastery and the five big ideas in teaching for mastery can be found on the NCETM website.

On 17 April 2023, the Education Secretary Gillian Keegan announced an increase in the number of schools supported by the Maths Hubs Teaching for Mastery programme. The Government committed to extending the programme to 75% of primary schools and 65% of secondary schools by 2025.[37]

2.3 The Advanced British Standard

Background

A baccalaureate is a qualification model with a broad set of required subjects and an emphasis on extracurricular learning.

Rishi Sunak first announced his ambition to overhaul 16 to 19 education as part of his initial, unsuccessful bid for the Conservative Party leadership between July and September 2022. During the campaign he outlined plans for a 'British baccalaureate', which would involve students studying English and maths up to the age of 18.[38]

Having become Prime Minister on 25 October 2022, an article in the Times from that month said Rishi Sunak was planning "a radical set of reforms to transform the nation's education system", which would include a new baccalaureate-style model of education at 16.[39]

36 National Centre for Excellence in the Teaching of Mathematics, The essence of mathematics teaching for mastery

37 HCWS715 [Maths Teaching] 17 April 2023

38 "Rishi Sunak as prime minister: What will it mean for schools?", TES, 24 October 2022

39 "British baccalaureate among Sunak education policy reforms", The Times, 26 October 2022

A year later, on 4 October 2023, Rishi Sunak announced the 'Advanced British Standard' (ABS) at the Conservative Party Conference.[40] On the same day, the Department for Education published a policy paper on the ABS.[41]

The policy paper explained the ABS would be "a new Baccalaureate-style qualification that takes the best of A levels and T levels and brings them together into a single qualification."[42] Among other things, the policy paper argued this was necessary because too many students leave education and training without the basic maths skills needed to succeed in life.[43]

In November 2023, the ABS was mentioned in the King's Speech:

> My Ministers will strengthen education for the long term. Steps will be taken to ensure young people have the knowledge and skills to succeed, through the introduction of the Advanced British Standard that will bring technical and academic routes into a single qualification.[44]

Proposals

The Advanced British Standard would consist of:

- A common core in which all students would study English and maths at an appropriate level and depth.
- A choice of academic and technical subjects that come in different sizes. While most A Level students currently study only three subjects, most students doing the ABS would study five subjects. This would be a mix of bigger and smaller subjects, called 'majors' and 'minors', with students typically doing three major subjects and two minor subjects.
- Non-qualification time which would include enrichment, pastoral, and employability activities for all students, and a relevant industry placement for students preparing for a technical occupation.

Maths will be available at different levels and depths with a clear minimum expectation for all students at age 16. This will be done by ensuring one of a student's ABS subjects include maths to at least minor level.

The Government has said it will take around a decade to implement the Advanced British Standard fully. It will launch a formal consultation on the

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40 "Advanced British Standard: Sunak qualification will replace A-levels and T-levels", BBC News, 4 October

41 Department for Education, A world-class education system: The Advanced British Standard, 4 October 2023. See also Department for Education Hub blog, The Advanced British Standard: Everything you need to know, 5 October 2023

42 Department for Education, A world-class education system: The Advanced British Standard, 4 October 2023, p7

43 Department for Education, A world-class education system: The Advanced British Standard, 4 October 2023, pp6-7

44 Prime Minister's Office, The Kings Speech 2023: Background and briefing notes, 7 November 2023, p11

approach and design of the new qualification in autumn 2023. This will inform a White Paper due to be published in 2024.

More information about the Advanced British Standard is available in the Commons Library briefing The reform of level 3 qualifications in England.

2.4 Funding

To achieve the aims of the Advanced British Standard, the Department for Education's policy paper set out associated funding of £600 million over two years.[45]

Much of this funding was focussed on maths and boosting teacher recruitment and retention, including:

- An additional £60 million of funding will be made available for maths education over the next two years. Some of this funding will be used to expand the reach of Maths Hubs in order to train more teachers in 'mastery in maths' techniques for post-16 education. The rest of the funding will be used to increase the Core Maths and Advanced Maths Premium and invest in a digital platform for tutoring in Core Maths, so colleges and schools can deliver maths to more students aged over 16.

- An investment of around £100 million a year to provide a tax-free bonus of up to £6,000 a year to all teachers in the first five years of their career, amounting to a total bonus of £30,000. This will be available for teachers who are teaching "key shortage subjects", including maths, and working in disadvantaged schools and all further education colleges.

- An additional £150 million will be made available each year to increase investment for students retaking English and maths GCSEs, as well as for apprentices who have not gained their level 2 qualification in these subjects.[46]

45 Department for Education, A world-class education system: The Advanced British Standard, 4 October 2023, pp37-38

46 Department for Education, A world-class education system: The Advanced British Standard, 4 October 2023, pp37-38

3 Reaction to the plans

The 'maths to 18' plan has received a range of responses from other political parties and organisations in the higher education sector. Many responses highlighted how the plan could be undermined by a shortage of specialist maths teachers.

3.1 Opposition parties

Labour

Labour's Shadow Education Secretary Bridget Phillipson responded to the maths to 18 plan announced in April 2023 with concerns and criticisms about targets for maths teacher recruitment and retention. She said:

> Once again, the prime minister needs to show his working: he cannot deliver this reheated, empty pledge without more maths teachers. But after 13 years of failing our children, the Tory government repeatedly misses their target for new maths teachers, with maths attainment gaps widening and existing teachers leaving in their droves.[47]

At his speech to the Northeast Chamber of Commerce in November 2023, the Labour Leader, Keir Starmer, outlined his party's plans for maths:

> Too many young people are leaving education without basic skills...Maths, digital skills, communication and teamwork. Skills we know every business needs. So Labour would deliver higher standards in our schools. Every child taught by expert teachers... A broader curriculum. Real world maths from an early stage. Preparing the next generation. To make sure that they are ready for work and ready for life.[48]

Liberal Democrats

The Liberal Democrats' education spokesperson, Munira Wilson, described the plan as an "empty promise" until teacher recruitment and retention is addressed by the Government. Wilson said:

> Gillian Keegan's empty words are an insult to millions of people who are looking to the Government for real solutions. You don't need a maths A-level to

47 "'Anti-maths mindset' costs UK a huge sum, Rishi Sunak claims", The Guardian, 17 April 2023

48 Labour Party, Keir Starmer's speech to the North East Chamber of Commerce, 3 November 2023

> see that these plans don't add up…Parents and children deserve a proper plan to recruit the extra teachers we need, not more empty promises.[49]

3.2 Education sector

Association of Colleges

Association of Colleges chief executive David Hughes criticised the focus on ages 16 to 18 as "short-sighted".[50] Hughes said efforts to improve numeracy should be targeted at a broader range of ages, with interventions needed from the early years to adult education.

Hughes also emphasised the important role colleges currently play in the delivery of maths education to 16- to 18-year-olds and how further support and improved pay conditions are needed to sustain this. He said:

> Three-quarters of 16 to 18 maths is delivered in colleges, so colleges are the crucial partner to delivering maths to 18. Our latest data shows 44% of colleges already struggle to hire enough maths teachers and with teachers in schools currently earning around £8,000 more than those in colleges, it is unlikely that struggle will ease any time soon.[51]

National education union

Joint General Secretary of the National Education Union Mary Bousted, described the maths to 18 plan as "a laudable aim… shared by school staff up and down the country". However, Bousted expressed concern about the "workforce crisis in education" of low recruitment and retention, concluding there is not enough teachers for this plan to come into fruition.[52]

Royal Statistical Society

Stian Westlake, the Chief Executive of the Royal Statistical Society, responded positively to the maths to 18 plan, describing it as "important and worthwhile" in light of the growing need for numeracy, statistical literacy, and data skills among young people.[53] However, Westlake also noted this will "require significant reform and investment", particularly into training maths teachers.

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49 "Prime Minister reaffirms his ambition on teaching mathematics with Maths to 18", FE News, 17 April 2023

50 Association of Colleges, Maths to 18: Focus is shortsighted and must be broader, 17 April 2023

51 Association of Colleges, Maths to 18: Focus is shortsighted and must be broader, 17 April 2023

52 NEU, Maths teaching, 17 April 2023

53 Royal Statistical Society, Response to the prime minister's proposal for all pupils in England to study maths until age 18, 4 January 2023

Association of School and College Leaders

In response to Prime Minister Rishi Sunak's January 2023 announcement, the General Secretary of the Association of School and College Leaders (ASCL), Geoff Barton, said evidence and "solid research" on why maths teaching and learning should be extended to those aged 16 to 18 was needed.[54] He also expressed concern about how measures would be implemented to "avoid exacerbating the already-chronic national shortage of maths teachers".

Barton expanded on some of these concerns in a blog post that criticised the Prime Minister for not consulting with school and college leaders ahead of his January 2023 announcement and questioned the rationale for the plan. He argued that A Level Maths was the most popular A Level choice for students and those that do not achieve at least a Grade 4/C were already required to continue to study either functional skills or GCSE maths during their post-16 courses.[55]

Following the Prime Minister's speech in April 2023, Geoff Barton again raised the issue of teacher shortages, saying the issue of recruiting and retaining teaching staff would "directly undermine" the maths to 18 plan.[56]

AQA

The qualifications provider AQA, which sets and marks over half of all GCSEs and A Levels in the UK, has called for numeracy, along with literacy and digital fluency, to be a focus for policy makers.

AQA has argued plans for maths to 18 and a 'British Baccalaureate' will be ineffective. It has said:

> AQA believes there is a clear and persistent problem in England with low levels of numeracy, literacy and digital fluency. Large numbers of young people continue to leave formal education without a firm grounding in these core skills, leading to poor outcomes in work and life.
>
> [...]
>
> There are lots of good qualifications and assessments out there, but they do a different job: they are there to rank order, and differentiate, whereas we need something where everyone can show their competence. Repeatedly resitting maths and English GCSE or requiring young people to study maths A-level are therefore not the right solutions to the problem. [57]

54 Association of School and College Leaders, ASCL comment on Prime Minister's ambition of maths to 18, 4 January 2023

55 Association of School and College Leaders, Rishi Sunak's maths-to-18 pledge is utterly out of touch, January 2023

56 Association of School and College Leaders, ASCL comment on Prime Minister's reaffirmation of maths to 18, 17 April 2023

57 AQA, Bacc to the future: don't get stuck in a time warp of old ideas when we need new solutions, 2 October 2023

Instead, the AQA has proposed "on-demand, 'when-ready' assessments focused on core knowledge and skills".[58]

[58] AQA, "A, B, C, it's as easy as 1, 2, 3". Towards new assessments for Numeracy, Literacy, and Digital Fluency (PDF), October 2023, p10

4 Education Committee scrutiny

The House of Commons Education Committee considered the Government's plans for Maths to 18 in an evidence session in February 2023 and an accountability session with the then-Schools Minister Nick Gibb in July 2023. In both sessions concerns were raised about the lack of specialist maths teachers, pupils' enjoyment of maths, and the issue of persistent maths GCSE resits.

In April 2023, the Commons Education Committee published a report on the future of post-16 qualifications and how effectively they prepare young people for the world of work.

The report noted England was unusual among comparative economies in not requiring the study of maths beyond 16 and said there were good reasons for introducing such a requirement, both for individuals and the economy. However, it also said making maths compulsory up to age 18 would present significant challenges in recruiting sufficient maths teachers, with this being a longstanding issue.

The issue of maths teacher supply has also featured in the Education Committee's inquiry into teacher recruitment, training, and retention.

4.1 Sessions covering Maths to 18

February 2023: Scrutiny of Maths to 18 proposals

On 7 February 2023, the cross-party House of Commons Education Committee heard from five witnesses who gave oral evidence on the Government's proposal of extending the study of maths to 18, and the broader context of maths education and numeracy.[59] The representatives were from:

- The Royal Society
- National Foundation for Educational Research (NFER)
- National Education Union (NEU)
- National Numeracy

[59] Commons Education Committee, Government proposals for compulsory maths to age 18 – oral evidence, 7 February 2023

- Association of School and College Leaders (ASCL).

The Maths to 18 proposal was generally welcomed, but concerns were raised about several issues, particularly workforce capacity.

Recruitment and retention of maths teachers

The lack of specialist maths teachers was consistently highlighted as a major problem by witnesses at the evidence session.

Niamh Sweeney from the NEU said the Maths to 18 proposal is not feasible because the Department for Education (DfE) had failed to meet its maths teacher recruitment target for eleven years, and the number of maths teachers in training was also at a low. She said:

> [A] golden hello and differential pay would not make that much of a difference. We have seen it before and just pushes the teacher shortage crisis elsewhere.[60]

Witness Jack Worth (NFER) said, in addition to the lack of consultation and transparency, the last published model suggested the Government's maths teacher recruitment target was to be around 3,000 per year for the next decade, but the target has since been reduced to 2,000.

Pupils' enjoyment of maths

Sam Sims of the National Numeracy charity told the session that younger learners who struggle with maths throughout their schooling develop maths anxiety, which follows them through to Key Stage 4. At this point they are likely to drop out of maths study, with the small number who resit their GCSE increasingly less likely to pass each time they try. He told the Committee that to address 'maths anxiety' and make maths relatable to everyday life, an alternative qualification should be developed.

Niamh Sweeney from the NEU said the school curriculum has been narrowed and pupils are 'taught to the test'. This has led to a loss of "experiment, enthusiasm and confidence" that stays with pupils from primary school to their GCSEs.

The issue of confidence and enjoyment of maths has long been reported as an issue. In 1982, the Cockroft report said:

> [maths] could be a source of enjoyment and challenge but for those whose mathematical ability was limited they were much more likely to lead to increasing loss of confidence, increasing antipathy to mathematics and sometimes even to feelings of humiliation which would long be remembered.[61]

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60 Commons Education Committee, Government proposals for compulsory maths to age 18 – oral evidence, 7 February 2023

61 Report of the Committee of Inquiry into the Teaching of Mathematics in Schools under the Chairmanship of Dr WH Cockcroft, Mathematics counts, 1982/86

GCSE resits

Niamh Sweeney (NEU) told the committee there is a problem with the way GCSE resits are currently done. She said:

> Simply sitting a test again and again, maybe with a different exam board, with a new teacher practising mock tests, is not the way to do it if you have struggled for seven years to hit that target.

Both Kevin Gilmartin (ASCL) and Sam Sims (National Numeracy) said they think the current system which makes GCSE maths resits a condition of funding should be changed.

Letter to Education Secretary

Following its evidence session on extending the study of maths to 18, the Chair of the Education Committee wrote to the Secretary of State for Education on 28 February 2023 (PDF). The chair raised a number of issues highlighted by witnesses, including:

- workforce capacity
- whether the real objective of extending study should be focused on academic maths or numeracy
- the importance of early years maths education
- the need to address negative attitudes towards maths
- the need for greater support for those who have not achieved grade 4 in GCSE maths.[62]

The Secretary of State for Education, Gillian Keegan, responded on 10 July 2023 (PDF).[63] On the issue of workforce capacity, she noted a number of incentives for training as a maths teacher and said:

> The department is carefully considering the workforce implications of maths to 18 across schools and further education (FE). As we develop our policy proposals, we will be able to determine the workforce necessary to deliver the Prime Minister's ambition.

Gillian Keegan also said rather than focusing on "rigid distinctions between arithmetic, numeracy and maths", the Government was concerned with ensuring all young people have the knowledge, skills, and confidence they need to use maths in a range of contexts and succeed in their future careers.

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62 Correspondence to the Secretary of State regarding the extension of maths provision up to 18 (PDF), 28 February 2023.

63 Correspondence from the Secretary of State responding to the Committee's letter on Government proposals for compulsory maths to age 18 (PDF), 10 July 2023

July 2023: Accountability session

On 18 July 2023, the Education Committee held an accountability session with the Schools Minister Nick Gibb and representatives from the Department for Education.[64] The first part of the session focused on the Government's proposals for Maths to 18.

The Minister was asked to clarify the Government's overall objective for the ambition to extend maths to 18 for all pupils. The Minister said:

> I am confident that we have seen significant improvements in maths attainment pre-16. We can build on that and address the fact that this country is an outlier in terms of the proportion of post-16 young people who continue to study maths beyond that period. We know that there are high returns to the economy and to individuals in continuing to study maths beyond 16. So that is the purpose: we want a higher proportion of young people continuing to study maths beyond 16.

On the issue of workforce planning, Education Committee member Kim Johnson said 40,000 teachers left the profession last year. Another Committee member, Ian Mearns, noted the recruitment target for maths teachers had been reduced and asked what the rationale for that was.

In response, the Minister pointed to strong recruitment of specialist maths teachers, but acknowledged the importance of retaining maths specialists and incentivising specialist teachers to return to the profession. He also said a formula is used to calculate recruitment targets for maths teachers and ministers have no control of this.

Persistent retaking of maths GCSE was highlighted by the Chair, Robin Walker, who questioned whether a functional skills qualification rather than GCSEs would be more inclusive. The Minister said this does already exist, but the expert advisory group will evaluate the exams system and suite of qualifications on offer.

The Minister and the DfE officials were also questioned on financial education, the economic benefits of maths to 18, applied maths, maths anxiety, and the social attitudes towards maths.

4.2 Inquiry into post-16 qualifications

In April 2023, the Commons Education Committee published a report on the future of post-16 qualifications.[65] It followed an inquiry launched in November 2021 that examined how effectively post-16 level 3 education and

64 Commons Education Committee, Government plans for maths to age 18 and school funding, 18 July 2023

65 House of Commons Education Committee, The future of post-16 qualifications, 28 April 2023, HC 55 Third Report of Session 2022–23

qualifications (such as A Levels, T Levels, BTECs, and apprenticeships) prepared young people for the world of work.

The report noted England was unusual among comparative economies in not requiring the study of maths beyond 16 and said there were good reasons for introducing such a requirement, both for individuals and the economy.[66] However, it also said making maths compulsory up to age 18 would present significant challenges in recruiting sufficient maths teachers, with this being a longstanding issue.[67]

The Committee's report recommended:

- As part of the introduction of compulsory maths up to 18, the Department for Education must convene an independent expert advisory panel to undertake an evidence-based assessment of any changes required to ensure curricula for post-16 maths delivers the practical and applied mathematical skills needed by students, employers, and the economy.
- The Department for Education must work with the sector to set out plans for how to tackle recruitment and retention of specialist maths teachers, and build a stronger foundation of numeracy and mathematical skills and knowledge at GCSE and below.
- The Department for Education should consider how focused qualifications in practical numeracy and financial skills could be used to broaden the reach of the Maths to 18 initiative, and ensure a wide variety of students can benefit from further study of mathematical skills in context.[68]

Government response

In its response to the committee's inquiry, published July 2023, the Government said the driving principle behind its plans for Maths to 18 was "to ensure that all young people are equipped with the right maths knowledge and skills to thrive, whatever their chosen pathway."[69]

The response said the Government had already convened an expert advisory group to advise on maths content, and how this should be reflected in a post-16 education system.[70] It also said it recognised making maths compulsory to

66 House of Commons Education Committee, The future of post-16 qualifications, 28 April 2023, HC 55 Third Report of Session 2022–23, paras 180-184

67 House of Commons Education Committee, The future of post-16 qualifications, 28 April 2023, HC 55 Third Report of Session 2022–23, para 185

68 House of Commons Education Committee, The future of post-16 qualifications, 28 April 2023, HC 55 Third Report of Session 2022–23, paras 189-191

69 House of Commons Education Committee, The future of post-16 qualifications: Government response to the Committee's Third Report of Session 2022–23, 5 July 2023, HC 1673 Fourth Special Report of Session 2022–23, para. 32

70 House of Commons Education Committee, The future of post-16 qualifications: Government response to the Committee's Third Report of Session 2022–23, 5 July 2023, HC 1673 Fourth Special Report of Session 2022–23, para. 48

18 would require a larger workforce and set out some of the work it had been doing in this area, including:

- Developing a new, fully funded mathematics National Professional Qualification (NPQ) for those leading maths teaching in primary schools which is expected to be available from 2024.
- Launching an expansion of the Taking Teaching Further programme, delivering funding for further education colleges to recruit and offer early career support to those with relevant knowledge and industry experience to retrain as teachers.
- Providing financial incentives to improve the recruitment and retention of maths teachers, including a £29,000 tax-free scholarship for trainee maths teachers starting in 2023/24.[71]

[71] House of Commons Education Committee, The future of post-16 qualifications: Government response to the Committee's Third Report of Session 2022–23, 5 July 2023, HC 1673 Fourth Special Report of Session 2022–23, para. 49

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