



Department  
for Education

# **Post-16 maths participation for pupils ending KS4 in 2018/19**

**Ad hoc statistics**

**January 2023**

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## Introduction

This report provides an estimate of post-16 maths participation for state-funded pupils at the end of Key Stage 4 (KS4) in 2018/19.

## Methodology

For transparency and replicability, where possible we use published data on post-16 maths participation, including the department's publications on [Key stage 4 performance](#) and [A level and other 16 to 18 results](#).

Technical documents published alongside these releases that explain their purpose, methodology, data sources and coverage can be accessed via the links above.

**This analysis does not follow a cohort of pupils and track their post-16 pathways.** Instead, we combine data sources to provide an estimate of post-16 maths participation. This methodology introduces a range of caveats, which are explained throughout.

Data from the 2018/19 academic year for KS4 attainment is used to reflect results from examinations taken prior to the COVID-19 pandemic. Attainment data from subsequent years should not be directly compared to this 2018/19 data for the purposes of measuring changes in student performance.

## Pupils at the end of KS4 in 2018/19

There were 542,621 pupils in state-funded schools at the end of KS4 in 2018/19.<sup>1</sup>

## Pupils not obtaining a grade 4 or above in GCSE maths

After the introduction of the [condition of funding](#) changes from 2014/15, most pupils are required to continue to study maths at post-16 as part of their study programme if they have not achieved a grade 4 or above in GCSE maths (or an equivalent qualification).

In 2018/19, 70.2% of state-funded pupils at the end of KS4 achieved a grade 4 or above in the EBacc<sup>2</sup> Mathematics component.<sup>3</sup> Therefore, 29.8% of pupils did not achieve this

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<sup>1</sup> 'KS4 national characteristics data' from 'Key stage 4 performance', Permanent data table – Explore education statistics – GOV.UK ([explore-education-statistics.service.gov.uk](https://www.gov.uk/explore-education-statistics))

<sup>2</sup> <https://www.gov.uk/government/publications/english-baccalaureate-ebacc/english-baccalaureate-ebacc>

<sup>3</sup> 'KS4 local authority data' from 'Key stage 4 performance', Permanent data table – Explore education statistics – GOV.UK ([explore-education-statistics.service.gov.uk](https://www.gov.uk/explore-education-statistics))

measure. Some pupils will have gained level 2 passes through functional skills qualifications.

As per the condition of funding requirements, these pupils would likely need to continue to study maths if they continue to post-16 education. A caveat of our methodology is that some of the cohort will not continue into education post-16 but are included in this estimate.

## **Pupils entered for maths subjects at A level and AS**

We use entries for maths<sup>4</sup> A level and AS from 2020/21 (provisional<sup>5</sup>), two years after 2018/19, as a proxy for entries by pupils at the end of KS4 at this point. Entries are from pupils in all state-funded settings aged 16-18.

In 2020/21, there were 79,160 A level and AS exam entries for maths subjects,<sup>6</sup> which is 14.6% of the cohort at the end of KS4 in 2018/19.

A level entries form the majority of the two (73,428 exam entries compared to 5,732), and typically pupils enter A level exams two years after completing their GCSEs.

Some pupils in these entry figures will not be these at the end of KS4 in 2018/19. Similarly, some entries from pupils at the end of KS4 in 2018/19 will not be included, e.g. if they entered A level and AS exams in another academic year. These effects act against each other, which reduces any impact on the estimate from our chosen methodology.

There may be some double counting of pupils in the entry figures for maths, where a student has entered multiple exams in maths subjects. For example, if a student entered both A level maths and A level statistics.

We have excluded further maths exams entries, given that these pupils will also have taken maths.

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<sup>4</sup> The entries for maths used reflects Total Maths entries which can include the subjects: Maths, Statistics, Mathematics (pure), Mathematics (statistics), Additional Maths and Use of mathematics.

<sup>5</sup> Final data for 2020/21 will be published in an update [to A level and other 16 to 18 results](#) on 2 Feb 2023

<sup>6</sup> ['Entries and Results - A level and AS by subject and student characteristics \(single academic year\)' from 'A level and other 16 to 18 results', Permanent data table – Explore education statistics – GOV.UK \(explore-education-statistics.service.gov.uk\)](#)

## Pupils entered for Core Maths

To include Core Maths entries data, we use provisional data for the academic year 2020/21. **These figures have not previously been published.**

The entry figure is 10,345 for students at the end of 16-18 study in 2020/21, which is 1.9% of the cohort at the end of KS4 in 2018/19. This includes entries in state-funded schools and colleges.

Core Maths is designed to be delivered over one or two years, and so some of these entries will not be for pupils that ended KS4 in 2018/19. Similarly, some entries from pupils at the end of KS4 in 2018/19 will not be in this figure. As with A level and AS entries, these effects act against each other.

We assume that those taking Core Maths are not taking a maths A level or AS, given this is the purpose of the qualification (i.e. to provide pupils not taking A level or AS the opportunity to continue to study maths post-16).

## Other pupils studying elements of maths post-16

There will be some state-funded pupils studying elements of maths post-16, which are not included in our figures in the previous sections, including:

- Those not studying maths subjects, but other subjects that have an element of maths, for example other STEM subjects, economics etc.
- Those studying Vocational technical qualifications and apprenticeships with a maths component (who are not studying maths as part of condition of funding)
- Those studying Free Standing Maths Qualifications
- Those studying maths as part of the International Baccalaureate

Therefore, the number of pupils not studying any form of maths at post-16 could be an underestimate.

However, as mentioned in a previous section some of those who do not achieve a grade 4 or above in maths GCSE (or equivalent) will not continue in education post-16. Hence, they will not be studying maths, which overestimates participation for this group.

These effects will to some extent cancel each other out, but we are unable to calculate their exact size under our chosen methodology. Therefore, we cannot assess the size and direction of any residual bias.

## Results

As seen in Table 1, under our chosen methodology we estimate around 46% of those in state-funded settings at the end of KS4 in 2018/19 participated in maths at post-16.

As we have explained throughout, there are caveats to these figures so they should not be interpreted as exact, but instead they provide an approximate indication of maths participation.

**Table 1: Estimates of post-16 maths participation for pupils at the end of KS4 in 2018/19**

	Cohort of pupils at end of KS4 (2018/19)	Estimate of cohort studying maths to meet condition of funding <sup>1</sup>	Total maths exam entries for A level and AS (2020/21)	Core Maths entries (2020/21)	Estimate of cohort <u>not</u> participating in maths post-16	Estimate of cohort participating in a maths qualification post-16
	(a)	(b)	(c)	(d)	(e) = (a) – (b) – (c) – (d)	(f) = (a) – (e)
<b>% of cohort</b>	100.0	29.8	14.6	1.9	53.7	46.3
<b>Number</b>	542,621	161,701	79,160	10,345	291,415	251,206

Source: KS4 data (2018/19), 16 to 18 attainment data (2020/21), Core Maths data (2020/21 – previously unpublished)

<sup>1</sup> To meet the condition of funding, a student must study an approved qualification. These are GCSEs, functional skills level 2 and certain other qualifications, known as ‘stepping stone’ qualifications. Full-time students who have a GCSE grade 3 or grade D must study a maths and/or English GCSE.



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