



Observatory for  
Mathematical  
Education

# Motivations of Year 12 students for choosing A level Mathematics

Themed report 25/04

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## Summary

Summer 2025 saw record entries to A level Mathematics and, for the second consecutive year, the subject had over 100,000 certifications<sup>1</sup>. This remains considerably higher than the second most studied subject at A level, which is Psychology with 75,000 entries<sup>1</sup>. Alongside this, the number of applications to study Mathematical Sciences at university in Autumn 2025 increased by 6% compared to 2024, and Engineering and Technology increased by 13%<sup>2</sup>. This raises the timely question of what motivates students to choose A level Mathematics.

The Observatory for Mathematical Education's post-16 cohort study is following over 7,000 students over 2 years of studying A level Mathematics in a representative sample of 119 state-funded research partner schools and colleges across England. Of these, 77 are 11-18 schools that are also participating in the Observatory's secondary cohort study, which is tracking around 26,000 students over a seven-year period as they progress through 150 schools, starting with Year 7 students in 2024-25<sup>3</sup>. The post-16 cohort additionally consists of 42 post-16 only institutions, including sixth-form colleges but not general further education colleges (who were the focus of our previous Mathematics in Further Education Colleges project<sup>4</sup>). This group of institutions will be referred to as 'colleges' within this report. The post-16 cohort study began in 2024-25 with all Year 12 A level Mathematics students in the 119 schools/colleges invited to participate, with a plan to follow them into Year 13 in 2025-26 and then beyond from 2026 onwards.

Data was generated through a carefully designed and piloted online survey that was distributed to partner institutions in February 2025. This report presents analysis of survey responses from 7,176 Year 12 A level Mathematics students, focusing on four key areas:

1. Future study/work intentions of Year 12 A level Mathematics students
2. The value of mathematics as a motivation for choosing A level Mathematics
3. Encouragement, advice and experiences as motivations for choosing A level Mathematics
4. Year 12 A level students' confidence in and enjoyment of mathematics

## Key findings

- 77% of Year 12 A level Mathematics students indicated they plan to [go to university](#). Of these, 67% [want to study a subject that includes mathematics but is not a mathematics course](#), while only 7% [want to study mathematics](#).
- 93% of students said they chose A level Mathematics because it will [look good on their university application](#), whatever course they apply for, and 92% because it will [look good on their CV](#), whatever job they end up applying for.
- [Parents](#) were an influence in choosing A level Mathematics for 60% of Year 12 A level Mathematics students and [teachers](#) were an influence for 51% of students. Of those that received [careers advice](#), 49% said it encouraged them to take mathematics.
- Around a quarter of students choose A level Mathematics because their [friends chose mathematics](#), or because of an [out-of-school enrichment activity or visit](#).
- Enjoyment and confidence may also have been factors in students' decision to take A level Mathematics, with 86% having [usually enjoyed studying mathematics](#) and 77% [expecting to get a high grade in A level Mathematics](#).

# 1. Introduction

## 1.1. Post-16 cohort study

The Observatory's large-scale post-16 research study began with Year 12 A level Mathematics students in 2024-25 and will follow them into Year 13 in 2025-26 and then beyond from 2026 onwards.

In the first year of the study, data collection included:

- An online survey of Year 12 A level Mathematics [students](#)
- An online survey of [parents/guardians](#) (of the Year 12 students in the study)
- An online survey of [teachers](#) (who teach the Year 12 students in the study)
- An online survey of [subject leaders](#) in the research partner schools/colleges
- Multiple visits to some of the research partner schools/colleges to observe A level Mathematics lessons and interview staff as part of [case study visits](#)
- [Matching of participant data](#) to wider information about them in the National Pupil Database (NPD), e.g. prior qualifications/grades, demographic and other characteristics of them and their schools/colleges

This report gives early insight into findings from the student survey. Student responses will later be combined with perspectives from parents, teachers and mathematics subject leaders, as well as additional qualitative and quantitative data, to generate more comprehensive insights.

## 1.2. Year 12 A level Mathematics student survey

The purpose of the student survey was wide-ranging and underpinned by the Observatory's cohort studies conceptual framework (described in Section 3.3 of the Introductory Report<sup>3</sup>). The survey contained question items across the following areas:

- Reasons for choosing A level Mathematics - the value of mathematics
- Influences on choosing A level Mathematics
- Experiences of learning mathematics in Year 12
- Learning mathematics outside of lessons
- Future study/work intentions
- Confidence and enjoyment of mathematics
- Perceptions of what mathematics is - the nature of mathematics

This report focuses on the first two sections of the survey, since they directly address students' motivations for choosing A level Mathematics. Findings about the closely related matters of students' future plans and their confidence at and enjoyment of mathematics are also reported briefly.

## 1.3. Year 12 A level Mathematics student survey respondents

There are 119 institutions in this study, of which 35% are post-16 only (Table 1). In general, such institutions have larger numbers of A level Mathematics students than 11-18 schools and this was borne out in the mean and median number of responses per institution to this survey (Table 1). In total, students at post-16 only institutions formed 65% of the survey respondents. Overall, there were more male than female students studying A level Mathematics (Table 2), although the gender gap was smaller in 11-18 schools than in post-16 only colleges. Over two-thirds of A level Mathematics students reported having achieved grade 8 or 9 in GCSE Mathematics, whilst a notable minority had grade 6 or lower (Table 2).

Institution type	Student responses	Number of institutions	Mean responses per institution	Median responses per institution
Post-16 only	4,661	42	111	92
11-18 School	2,515	77	33	22
<b>Total</b>	<b>7,176</b>	<b>119</b>	<b>60</b>	<b>36</b>

Table 1 Number of Year 12 A level Mathematics student survey responses, by institution type.

Institution type	Student responses	female	male	other term	GCSE Mathematics grade			
					9	8	7	≤6
Post-16 only	4,661	36%	61%	3%	32%	36%	26%	7%
11-18 School	2,515	42%	56%	3%	32%	39%	23%	6%
<b>Total</b>	<b>7,176</b>	<b>38%</b>	<b>59%</b>	<b>3%</b>	<b>32%</b>	<b>37%</b>	<b>25%</b>	<b>6%</b>

Table 2 Number and characteristics of Year 12 A level Mathematics student survey responses, by institution type.

While the focus here is on the self-reported student characteristics of gender and GCSE Mathematics grade, data matching with the NPD will allow for a wider range of characteristics to be considered in future analyses.

## 2. Future study/work intentions

This section outlines students' intended plans for progression immediately after the completion of A levels, since this provides contextual information for their perceptions of the importance of A level Mathematics for these future plans, reported in section 3.

<i>After sixth form (or a gap year), I will probably...</i>	Overall responses		Responses by institution type			
			Post-16 only		11-18 school	
Go to university	5,309	77%	3,348	75%	1,961	81%
Start employment or work-based training	633	9%	456	10%	177	7%
I have no clear plan	777	11%	552	12%	225	9%
Other	170	2%	101	2%	69	3%
<b>Total</b>	<b>6,889</b>		<b>4,457</b>		<b>2,432</b>	

Table 3 Student responses<sup>5</sup> for their plans after sixth form, overall and within schools/colleges.

<i>At university I want to study...</i>	Student responses	%
Maths	389	7%
A subject that includes maths but is not a maths course	3,530	67%
A subject that doesn't include maths	625	12%
I have no clear plan	569	11%
Other	196	4%
<b>Total</b>	<b>5,309</b>	

Table 4 Year 12 A level Mathematics student plans for study at university, for those who indicated they intend to go to university.

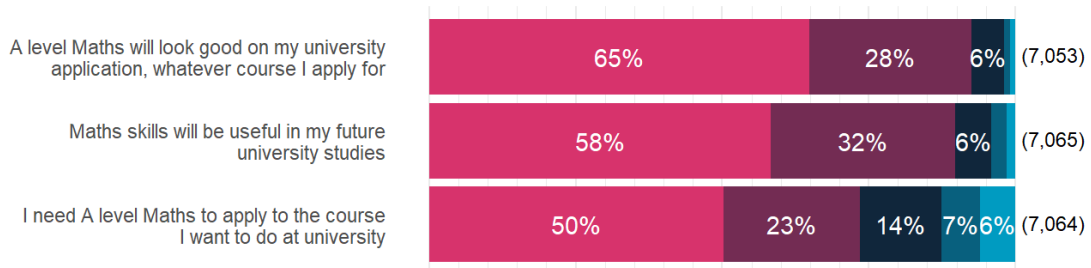
Over three quarters of those currently in Year 12 who are studying A level Mathematics plan to go to university after sixth form (Table 3). This was slightly higher for students in 11-18 schools than in post-16 colleges (81% and 75% respectively). Around 1 in 10 students overall (9%) signified intent to start employment or work-based training immediately after sixth form, whilst a similar proportion (11%) indicated that they have no clear plan.

Among Year 12 students that intend to go to university, only 7% currently want to study mathematics (Table 4). However, a large majority (67%) want to study a subject that includes mathematics. Questions about future intentions will be repeated in the Year 13 survey, in order to understand changes to students' plans across the course of their A level studies.

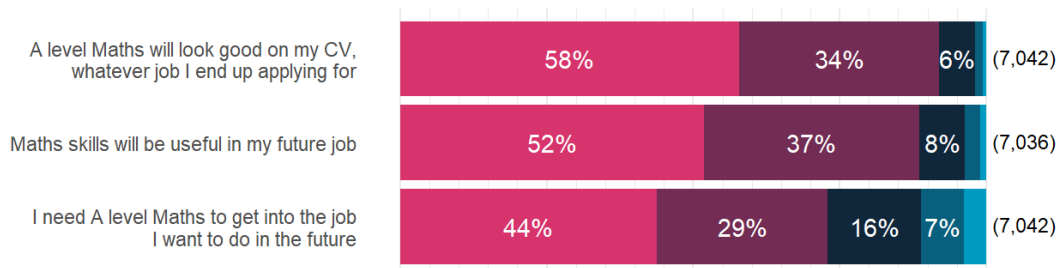
### 3. Reasons for choosing A level Mathematics

#### I chose A level maths because ...

##### a) Future study factors



##### b) Future employment factors



##### c) Other factors

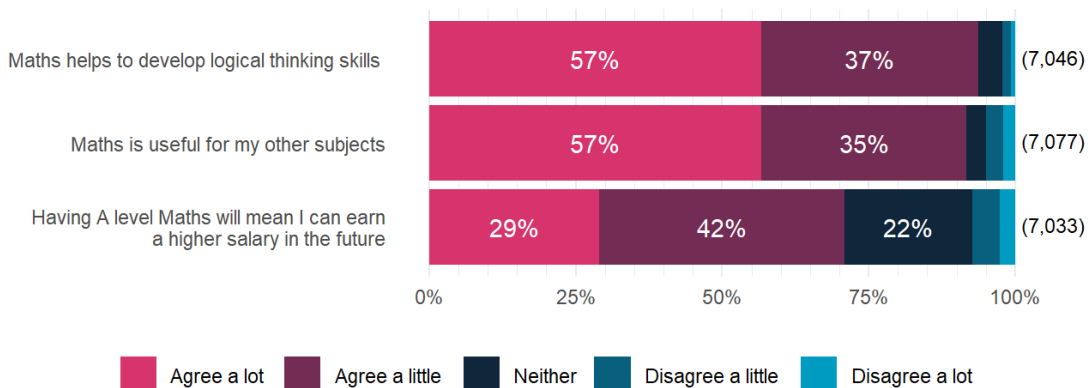


Figure 1 The extent to which Year 12 students agree that a) future study factors, b) future employment factors, c) other factors, influenced them to take A level Mathematics (N is at the end of each row).

Future study factors showed the highest levels of agreement as reasons for students choosing A level Mathematics (Figure 1a)<sup>5</sup>. 93% of students agreed (either a lot or a little) that they chose A level Mathematics because it will look good on their university application for any course they apply for, and 90% indicated that mathematics skills will be useful in their future university studies. A smaller proportion, although still a majority, thought that they would need A level Mathematics as it would be an entry requirement of their chosen university course (73%).

Although agreement was less strong than for factors relating to future university studies, a large majority of respondents also agreed that future employment factors contributed to their decision to study A level Mathematics (Figure 1b). The highest levels of agreement (either agree a lot or agree a little) were for the statements that *A level Maths will look good on my CV* (92%) and *maths skills will be useful in my future job* (89%). Slightly fewer students agreed that they need A level Mathematics to get into the job they want to do in the future (73%), or that higher future earnings were a factor in their A level subject choice (71%; Figure 1c). In addition, the latter had one of the lowest 'agree a lot' values (29%), but largest 'agree a little' values (42%) in this set of questions.

## 4. Influences on choosing A level Mathematics

I chose A level maths because...

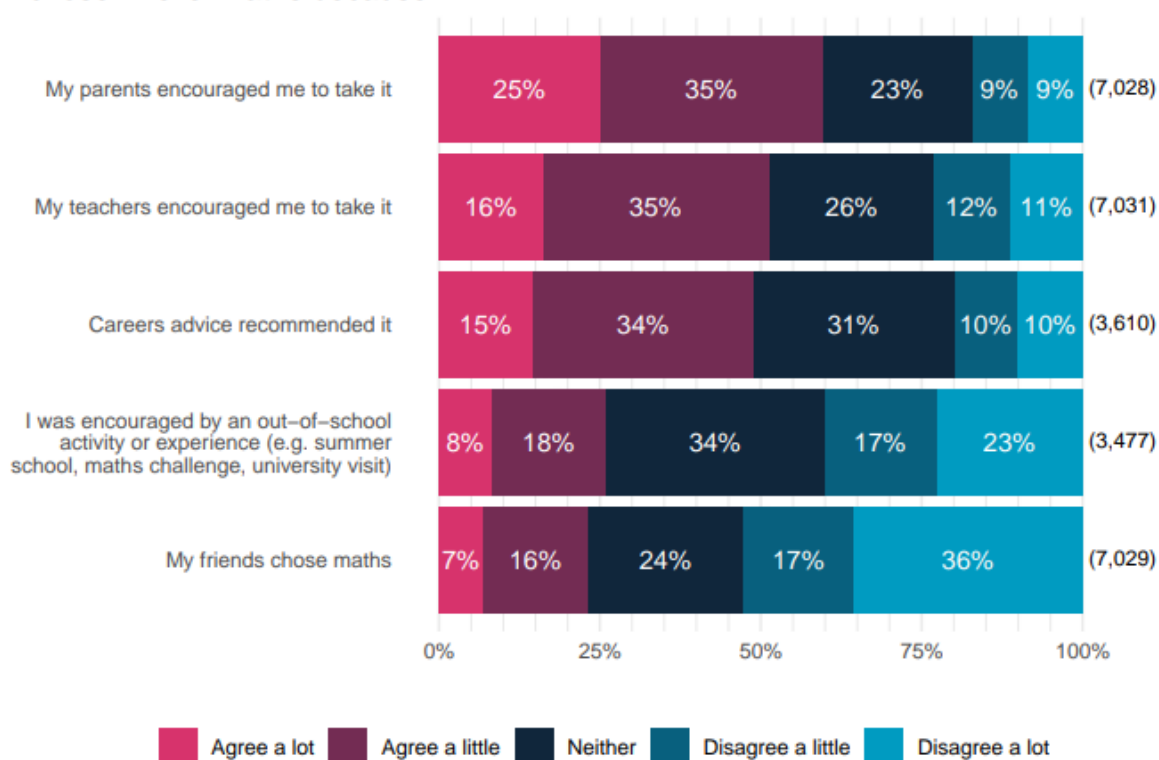


Figure 2 The extent to which Year 12 students agree that certain factors influenced them to take A level Mathematics (N is at the end of each row).

As well as questions about the value of A level Mathematics, the survey also asked, *Who or what influenced you to take A level Mathematics?* (Figure 2)<sup>5</sup>. While none of these influences received as much agreement as the 'value of mathematics' items, a majority of students reported that encouragement from parents and encouragement from teachers were motivations for choosing A level Mathematics (60% and 51%, respectively). Few students agreed that the influence of friends who also chose mathematics was a factor in their choice.



Indeed, 53% actively disagreed (a lot or a little) that friends were a motivation for choosing A level Mathematics. Across all of these items, around a quarter of students gave neutral responses, neither agreeing nor disagreeing with the statements.

As part of the survey there were two filtering questions for this topic. One related to if careers advice on A level choices had been received and the other if additional activities had been attended. Around half of all survey respondents indicated that they had received careers advice on A level choices (51%) or attended out of school activities/experiences (49%). Only students that responded yes to these questions were then asked about their influence on A level Mathematics choice, as reported in Figure 2.

Among those that received them, careers advice appears to have had a greater influence on A level Mathematics choice than out-of-school activities and visits (49% and 26% agreed, respectively; Figure 2). Students at 11-18 schools were slightly more likely to report having received careers advice about A level choices (57%) compared to college students (48%). Also notable is that 14% of students were unsure whether they had received any careers advice.

Students with higher GCSE Mathematics grades were more likely to report having taken part in out-of-school experiences such as summer schools, mathematics challenges and university visits. For example, 64% of students with a GCSE Mathematics grade 9 (the highest grade) had taken part in some kind of out-of-school mathematics enrichment activity, compared to only 33% of students with grade 6.

## 5. Confidence and enjoyment of mathematics

The survey included items about students' confidence in their mathematical abilities and enjoyment of mathematics as a subject, although these were not framed in terms of reasons for choosing A level Mathematics. Nevertheless, 77% of Year 12 students taking A level Mathematics agreed (a lot or a little) that *I expect to get a high grade in A level Maths* and 71% agreed that *I am confident in maths*. Likewise, most respondents agreed that *I have usually enjoyed studying maths* (86%) and *maths is a very interesting subject* (82%). In general, these are slightly lower levels of agreement than for the value of mathematics for future study/work (Section 3) but higher agreement than for the influence of parents, teachers, and careers advice (Section 4).

Comparison with other subjects may have also contributed to the decision to study A level Mathematics. One of the highest levels of agreement among the confidence items was for the statement *maths was one of my best GCSEs* (88%), with 69% of students agreeing a lot. In terms of enjoyment, 87% of students agreed that they would prefer to do mathematics than write an essay, with 71% agreeing a lot.

The confidence and enjoyment sets of question items are another example of where extensive further analysis will be undertaken, both within the Year 12 student survey, and across the Observatory's other cohort studies (Primary and Secondary).

### In conclusion

This short report has introduced a new large-scale post-16 cohort study being undertaken by the Observatory for Mathematical Education. It has given early insight into data from one of the multiple areas of research taking place. This data will later be combined with perspectives from parents, teachers and mathematics subject leaders, as well as additional qualitative and quantitative data, to generate more comprehensive insights. Discussion of findings and policy relevant outputs will follow in additional publications.

# The Observatory for Mathematical Education

The Observatory for Mathematical Education is undertaking an unprecedented ten-year programme of longitudinal research from reception to postgraduate level. This holistic, multi-scale and mixed-method programme aims to better understand our national system of mathematical education and support those trying to improve it. Further details can be found in the Introductory Report on the website.

## Acknowledgements

This report was authored by Stephen Lee, Jennifer Norris and David Sirl, with additional Observatory team members contributing to the survey design, data generation and aspects of the analysis.

## Citation details

Observatory for Mathematical Education. (2025). *Motivations of Year 12 students for choosing A level Mathematics*. University of Nottingham.

## Endnotes

1. JCQ (2025) A and AS level trends. Summer 2025. <https://www.jcq.org.uk/wp-content/uploads/2025/08/A-and-AS-level-trends-June-2025.pdf>
2. UCAS (2025) UK universities and colleges see record numbers of UK 18-year-old-applicants. <https://www.ucas.com/corporate/news-and-key-documents/news/uk-universities-and-colleges-see-record-numbers-of-uk-18-year-old-applicants>
3. Observatory for Mathematical Education (2024) Introductory report: concepts and plans. University of Nottingham. <https://www.nottingham.ac.uk/observatory/documents/observatory-intro-report-021224.pdf>
4. Mathematics in Further Education Colleges project. <https://www.nottingham.ac.uk/research/groups/crme/projects/mifec/>
5. Tables and figures exclude the small proportion of non-responses to each question.

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