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Discussing maths in UCAS references and personal statements

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Starter activity

- In no more than twelve words, sum up why you like maths.
- Your response must be a coherent English sentence!

Session aims

This session is intended to give you increased confidence in the following:

- Guiding students in writing about their mathematics in personal statements
- Writing content that might contribute to a student's reference, with a focus on their mathematical achievements

Most common first lines in personal statements (2015)

1. From a young age I have (always) been [interested in/fascinated by]... [1,779]
2. For as long as I can remember I have... [1,451]
3. I am applying for this course because... [1,370]
4. I have always been interested in... [927]
5. Throughout my life I have always enjoyed... [310]
6. Reflecting on my educational experiences... [257]

Most common first lines in personal statements (2015)

7. Nursing is a very challenging and demanding [career/profession/course]... [211]
8. Academically, I have always been... [168]
9. I have always wanted to pursue a career in... [160]
10. I have always been passionate about... [160]
11. Education is the most powerful weapon which you can use to change the world... [148]

Personal statements – what the admissions tutors say

“The most common mistake I see is a submission where the student waffles on about having a love of mathematics without saying why exactly, or what excites/motivates them.”

Peter Larcombe, Derby

Personal statements – what the admissions tutors say

“Highlight what makes you unique. Why should I spend time reading your application over the other hundreds that I receive? Have you done some extra-curricular things above what everyone else with an A level has?”

Tristan Pryer, Reading

Personal statements

Task 1:

Arrange the student statements along a percentage line. Where the statement goes should correspond to the likely proportion of applicants for whom this would apply.

Task 2:

Take a statement and consider what additional information the student should aim to include to make the statement personal and meaningful.

Focus on the subject!

“Many universities will be interested in extra-curricular activities, including your hobbies and interests, work experience, voluntary work and any positions of responsibility that you may have held either in school or elsewhere. At Cambridge, our admissions decisions are based on academic criteria (ability and potential), so we only consider extracurricular activities that are relevant to the course you’ve applied for.”

References

Task 1:

Read each reference and try to guess the accompanying predicted grade.



References

Task 1:

Read each reference and try to guess the accompanying predicted grade.

Katie: A* in Maths, A in Further Maths

Bob: D in Maths

Alice: A in Maths

Ravi: C in Core Maths

References

Task 2:

Choose a reference and critique it from the point of view of an admissions tutor.

Points to consider:

- How well does the reference help you to ‘get a feel’ for the student?
- Which sentences are most/least informative?
- What further questions would you want to ask the referee about the student?

Maths in other subjects

Marta is taking A levels in Art, Photography and Maths. She is applying for a graphic design course at university. What might her maths teacher focus on if asked to contribute to her reference?

The following are just some possibilities:

- Precision/attention to detail
- Clarity of diagrams/solutions
- Problem solving/creativity
- Understanding of patterns/connections
- Response to feedback
- Use of technology
- General work ethic/organisation with deadlines

Cross-curricular skills

- Problem solving
- Structuring of solutions
- Following algorithms/processes
- Analytical and logical reasoning
- Spotting patterns and making links
- Mathematical modelling
- Factual recall
- Numeracy and statistical fluency
- Use of technology



The reference

Focus on **evidence**:

- Extra-curricular subject interest
- Curiosity and resilience
- Analytical and logical reasoning
- Academic potential/journey
- Specific achievements, e.g. test results, strengths in particular topics/skills
- Comparison to peers/previous cohorts
- Contextual reasons for existing/potential underperformance

About MEI

- Registered charity committed to improving mathematics education
- Independent UK curriculum development body
- We offer continuing professional development courses, provide specialist tuition for students and work with employers to enhance mathematical skills in the workplace
- We also pioneer the development of innovative teaching and learning resources

<p>I have taken part in the UKMT Maths Challenges at all levels, achieving gold at both junior and intermediate level</p>	<p>I have twice represented my school in regional UKMT Senior Team Maths Challenge heats</p>
<p>As part of my extended project I researched how arithmetic works in different ancient number systems</p>	<p>I have read 'The Music of the Primes' by Marcus de Sautoy</p>
<p>I attend voluntary after school sessions on STEP, MAT and TMUA preparation</p>	<p>During the summer I worked through an old FP3 text book and taught myself the content</p>
<p>I help out in a Year 7 maths class once a week</p>	<p>I set up and coordinate a 'Maths discussion group' that meets weekly to work on interesting problems we have found</p>
<p>All my homework is in on time and I usually get full marks</p>	<p>I peer tutor two Year 12 students who have been struggling to adapt to A level Maths</p>
<p>I attended a university taster day organised by my school, where we learnt about degree level maths</p>	<p>My school maths department sets a 'problem of the month' and my solution has won the prize three times</p>
<p>I regularly listen to the Radio 4 show 'More or Less'</p>	<p>I attended a series of problem solving classes run on Saturdays at my local university</p>

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Tips for writing a mathematical UCAS personal statement

Remember the following general key points when writing a personal statement:

1. You should focus on the **subject** you are studying for.
2. Less is more – detail about a small number of achievements is better than bland lists.
3. Prioritise material that makes you stand out.

Read this useful general advice produced by the Sutton Trust: <https://www.suttontrust.com/wp-content/uploads/2016/01/Making-a-Statement-FINAL.pdf>

It may also be useful to consider the following:

Do focus on what it is that you enjoy about mathematics. Try to be specific (e.g. discuss a particular problem you enjoyed working on rather than say “I enjoy puzzles that make me think”).

Do concentrate on the last couple of years. If you mention a competition that you won in Year 9 the admissions tutor will assume you haven’t achieved anything since.

Do focus on achievements that make you stand out from the crowd. Taking part in maths challenges and attending revision sessions are great, but most students applying for maths will have done these. What have *you* done that few other students will be able to talk about?

Do spend the majority of your statement talking about maths (at least two thirds, probably more). When talking about extra-curricular activities, prioritise those that are most relevant to the course.

Do demonstrate an awareness of what you are likely to study at university. Maths at degree level is a very broad subject. What are you most looking forward to learning about? Why? What have you already done to research this topic? (But be careful – see the next point.)

Do read the application guidance on the individual universities’ websites. For example, they might express a preference for how much extra-curricular stuff to include. Likewise, research course content; it would be embarrassing to say that you are looking forward to a topic that one of your universities does not cover.

Do concentrate on work and research you have done outside of the classroom. (It is fine to talk about activities organised by your school, provided you focus on what you gained personally.)

Do proofread your statement after you have pasted it into the UCAS website. Some mathematical characters will not appear properly, so you may need to find a way around this if you want to include mathematical notation.

Don’t mention a particular university choice by name – the same statement goes to all five. It is fine to talk about enrichment events you attended at a particular university, provided you explain why it was useful.

Don’t just list books you’ve read or topics you have covered. If you have read lots of maths books pick one and go into detail about what you learned, maybe even just focusing on a particular chapter. If possible, avoid ‘obvious’ popular authors such as Simon Singh or Marcus de Sautoy.

Don’t rely on clichés and be wary of including jokes – the admissions tutor may not get your sense of humour, especially in written form. Likewise, avoid the use of famous quotes unless you are specifically using them to elaborate about a particular point.

Most importantly, remember that the admissions tutor loves maths so much that they do it for a living – they want to know that you love it too!

Example references for discussion

Katie (Maths and Further Maths)

Katie is passionate about mathematics and is an exemplary student in terms of organisation, focus and accuracy. Rather than being deterred by abstract aspects of the subject, Katie excels in thinking about mathematical ideas in a new way and enjoys the challenge of the more unstructured questions found in the Further Pure Mathematics syllabus. As a result, she has developed problem solving skills that are unmatched within her peer group. She is also comfortable with applied topics, as demonstrated by the full marks she has obtained in every discrete maths test to date; this is a unique achievement as even her most able classmates have made silly errors or failed to include enough detail in written answers. Katie, on the other hand, is meticulous in her attention to detail; on the rare occasions that she makes a mistake she will painstakingly pick through her solution until she fully understands the error. As such, she has a genuine admiration for the power of algebraic proof, and likes nothing more than the challenge of searching for an approach that is not only correct, but also elegant and concise.

Bob (Maths)

In A level Mathematics Bob is familiar with a variety of equations and methods and can complete calculations proficiently. He has made good progress in several areas of mathematics, including algebra, geometry and trigonometry. He is also familiar with the concept of a mathematical model, having covered topics in statistics and mechanics, and he shows particular enthusiasm when solving applied mathematics problems. Indeed, on more than one occasion he has shared with his class examples of how he has used his mathematical knowledge in helping his parents to manage their farming business. Bob has demonstrated a secure ability to reproduce algorithmic processes and now scores highly in assignments that test key methods. At the start of the course his marks were towards the bottom of the group, but he is now consistently in the top half. He is now in a position to focus on how to cope with more unstructured, problem-solving questions.

Alice (Maths)

Alice is a committed and highly skilled mathematician who is able to make connections within different areas of the curriculum. Her algebraic fluency is matched by a thorough understanding of newer concepts, such as calculus, and she appreciates how different topics can be connected. She has experience of modelling physical problems through her mechanics work and has shown a good understanding of the limitations this approach. Her written work is well structured and assignments are always submitted promptly. When Alice joined the school she was placed in a maths class where she did not know anyone, but this has not stopped her from succeeding. She certainly has the necessary aptitude to study mathematics at university and could also apply her knowledge and skills easily to other STEM courses.

Ravi (Core Maths)

I have been delighted by how well Ravi has adapted to the demands of Core Maths. Although he sometimes struggled with some of the functions and graphs work at GCSE he has persevered this year and now understands how valuable these methods can be in modelling real-life situations. In a group task on simulating stock growth in financial mathematics he produced the most accurate predictions, and this visible boost to his confidence has seen him participate increasingly actively in class discussions. He is highly motivated by politics and showed real insight during a recent activity on analysing NHS waiting times. Despite his personal political bias he appreciated the need to ensure that his points were backed up by sound mathematical reasoning and left the lesson determined to apply the same rigour to his other beliefs; it is great to see him voluntarily applying his mathematical skills outside of the classroom.

Tips for writing mathematical UCAS references

Most importantly, remember the following key points when writing a UCAS reference:

1. It should be specific to the student.
2. It should focus on their mathematical skills and achievements.
3. Evidence should be quoted whenever possible.

It may also be useful to consider the following:

Do check what the student is applying for. If the subject is heavily maths related then go into plenty of detail, as your contribution will obviously make up a substantial part of their final reference. If the subject is less connected then try to focus on the key skills that could be relevant. E.g. if a student is applying for modern languages then maybe mention their ability to follow rules and spot patterns, and their communication skills when explaining findings.

Do make comparative statements where possible. Sentences such as "Fred is an excellent student" are far less informative than "Fred is among the very best students in his year", "Fred regularly achieves one of the top two highest marks in class tests" or "Fred is one of the most engaged and proactive students I have taught in the past ten years".

Do mention *specific* achievements or interests. If modular or AS exams have been taken, definitely highlight any results over 90%, as universities see grades but not UMS marks. You could also refer specifically to internal assessments or GCSE raw scores.

Do talk about how the student has developed during the course; universities like to hear about students being on an "upward trajectory". This is a useful way to approach references for students who are not high achievers - in which areas do they show promise, or where have they made improvements based on your advice? Universities want students who are keen to learn, not people who already think they know it all!

Do complement the student's personal statement. If they are struggling for space help them out by focusing your reference on school-based achievements to allow them to focus on what they have achieved outside of school.

Do write different references for different students. It may seem a silly thing to say, but students applying for similar courses often apply to similar institutions. Clearly it is important that they sound like different people (which they are) so try to limit the use of cut and paste and comment banks. Also see the following point...

Don't use generic statements taken from specifications or grade descriptions. For example, "Jenny interprets solutions to problems in their original context, and, where appropriate, evaluates their accuracy and limitations". This doesn't really tell us anything about Jenny other than the fact that her teacher has read the assessment objectives.

Don't be critical. This is a reference, not a report, and so it should focus on the positives. This does not mean that lazy students should get glowing references to the detriment of good students. In practice their references will just be shorter and less effusive. Admissions tutors are very good at reading between the lines.