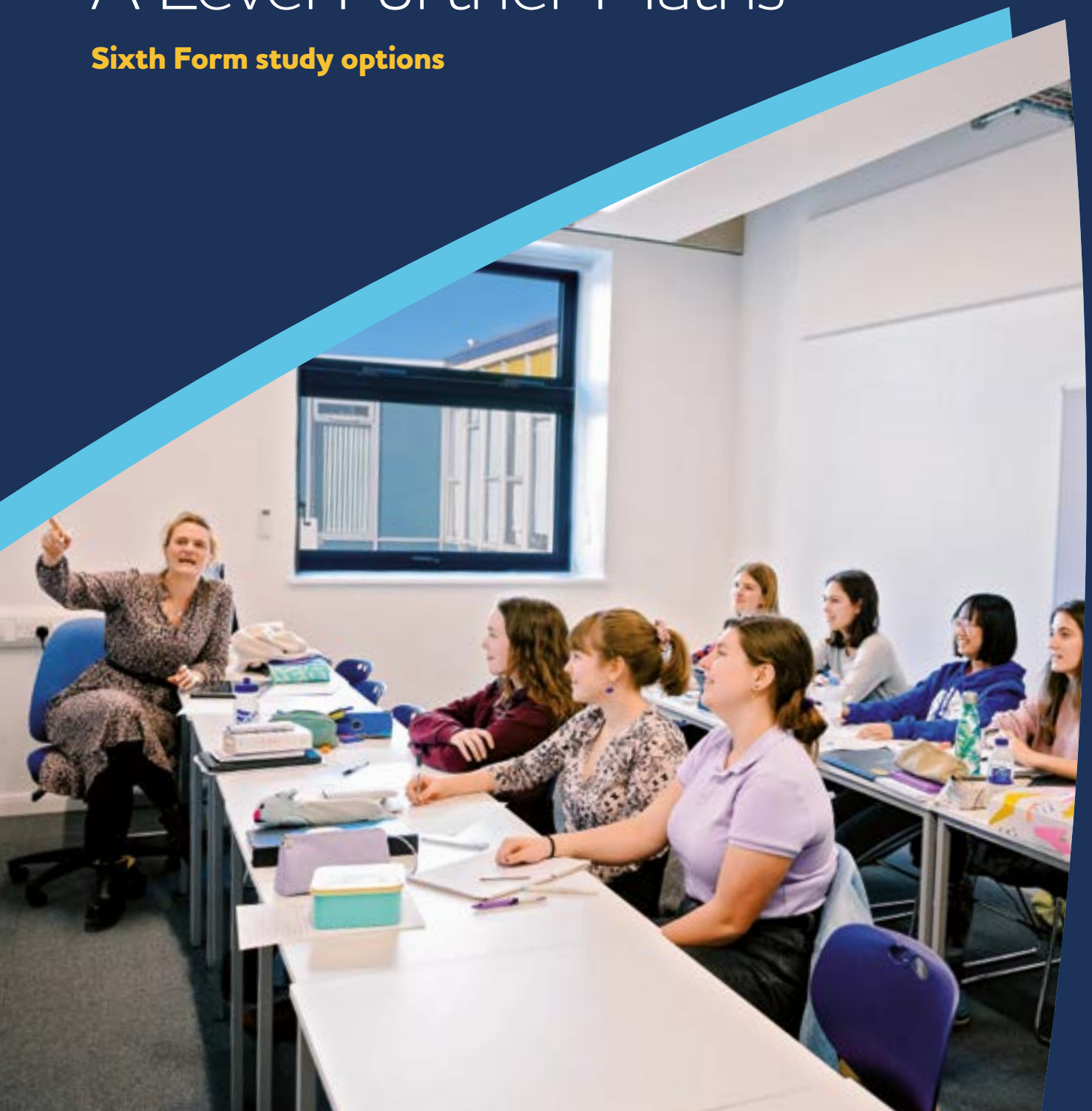
OXFORD
HIGH SCHOOL
GDST

A Level Maths and A Level Further Maths

Sixth Form study options



A Level Maths & Further Maths

A Level Maths – Edexcel 9MA0

A Level in Maths has two distinct components – Pure and Applied – and you will study both of these over the course of two years.

Pure Maths

Pure Maths extends many topics you are already familiar with such as sequences, trigonometry, graphs and geometry. It will also introduce you to new areas of Maths such as calculus, series, logarithms and proof. It is very algebraic and so it is important that you are confident with the algebra skills from your (I)GCSE course such as indices, quadratics, straight line graphs, solving equations and rearranging formulae. Pure Maths makes up two-thirds of the course content.

Applied Maths – Mechanics and Statistics

Mechanics and Statistics are branches of Applied Maths. In Mechanics you will look at how objects behave when they are acted on by different forces such as gravity and friction. You will learn about vectors, study projectiles and apply Newton's Laws of Motion. Statistics is about analysing and interpreting data. You will learn ways of displaying and processing sets of data, and consider the implications of your results. There are new techniques for looking at probability and you will be able to test whether a result is statistically significant. Mechanics and Statistics together make up one-third of the course content.

> The essence of Mathematics is not to make simple things complicated but to make complicated things simple.
>
> **S. Gudder**

Assessment

A Level Maths is assessed by three equally weighted exams at the end of Year 13, each lasting two hours. Two of the exams cover the Pure Maths content, and in the third Applied paper, you will answer questions on Mechanics and Statistics. You can use a calculator for all three papers.

Lessons

You will have 9 lessons a week, normally split between two teachers.

A Level Further Maths – Edexcel 9MF0

If you choose to take A Level Further Maths you will study two full A Levels in two years; at OHS we start both courses in Year 12, with the balance weighted towards A Level Maths. Then, in Year 13, the balance is flipped as we finish off A Level Maths and get stuck in to the remainder of the Further Maths course. It is hard work and intense: a challenging and demanding course, but one that can ultimately be very rewarding. If you are thinking about taking A Level Further Maths, please discuss it with your Maths teacher.

Content

A compulsory core of Pure Maths makes up 50% of the Further Maths A Level. Here you will extend many of the concepts you met at A Level as well as being introduced to new ones like complex numbers, matrices, polar coordinates and hyperbolic functions. The remaining 50% of the course is optional content, and at OHS you will continue to study both Mechanics and Statistics. Further study of topics such as probability distributions and hypothesis testing in Statistics, and collisions, elasticity and momentum in Mechanics will enable you to develop an excellent grounding in both these aspects of Applied Maths.

Assessment

In adition to the exams for A Level Maths, you will take four equally weighted $1\frac{1}{2}$ hour exams for A Level Further Maths – two Pure Maths, one Mechanics and one Statistics. You can use a calculator for all the exams.

Lessons

You will have 15 lessons a week, with three or four different teachers.

Calculators

You will need to upgrade your calculator. The A Level Maths course requires one that can carry out specific statistical functions and the process of iteration, while the A Level Further Maths course calls for a calculator that can also work with matrices. We will advise you of an appropriate model and support you as you learn how to use it.

You do not need a graphical calculator, although you are permitted to use one during the course and in all the exams.

Enrichment

Year 12 mathematicians can take part in the UK Maths Trust Senior Maths Challenge in the Autumn Term, with many Year 13s opting to take part as well. Many girls are awarded certificates each year, and a few of the highest scorers also qualify for the follow-on rounds – the Senior Kangaroo and the Olympiad. Some girls will also have the opportunity to enter the MOG – the Mathematical Olympiad for Girls.

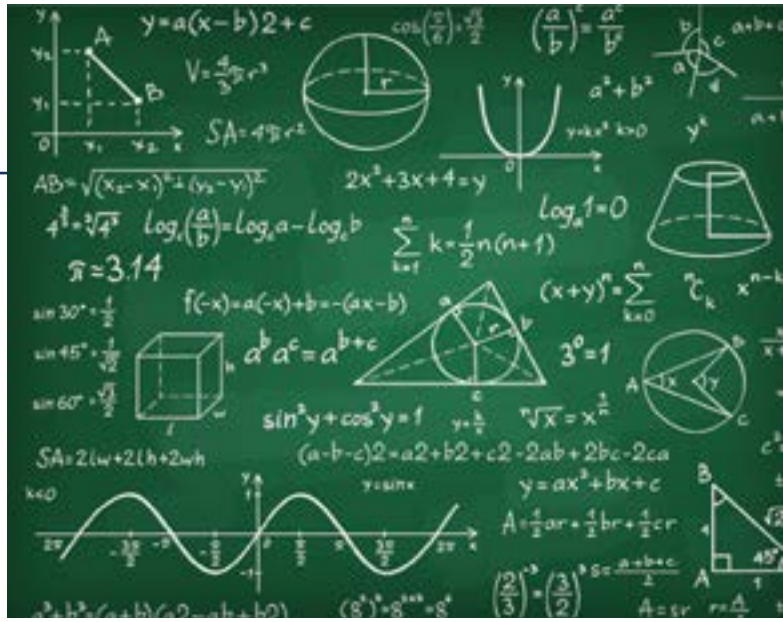
Taking advantage of our proximity to Oxford University, we attend lectures and study days at the Mathematical Institute. In recent years, students have had the opportunity to listen to pre-eminent mathematicians such as Marcus du Sautoy, Roger Penrose and Andrew Wiles as well as attending days that help guide students who are considering mathematically-based courses at university with their choices.

Over the past few years we have also welcomed a number of mathematicians into school to talk about their areas of study. For example, Dr Vicky Neale and Professor Martin Bridson from the Mathematical Institute talked about prime numbers and group theory respectively, while science educator Dr Emily Grossman spoke about the misuse of statistics by the media.

Maths and University Courses

There are a few university courses that require A Level Maths.

Obviously if you want to study Maths at university, you will be planning on taking it, and probably Further Maths too. Some universities will also ask you to take a STEP paper (Cambridge and Warwick, for example) or a pre-interview test (Oxford), or recommend that you take the TMUA (such as Durham, Lancaster, Sheffield and Southampton). We have plenty of experience in preparing students for these additional requirements and organising practice interviews as well as supporting large numbers of girls through their A Level Maths each year. We are very pleased that recent years have seen a steady stream of girls choosing to pursue Maths at university level, both on its own and in combination with subjects such as Music and Physics, at universities such as Cambridge, Oxford, Warwick, St Andrews and Imperial.



If you want to study any kind of Engineering or Physics/Physical Sciences, Maths will also be a requirement, and almost all universities specify that you need Maths if you want to study Economics. Some universities also like to see that you have studied Further Maths for these subjects as well. Computer and Actuarial Sciences courses also commonly ask for Maths. If you have a clear idea of what you want to study in the future, it is important that you check the relevant websites carefully for the latest advice, or talk to Ms Heath (Head of Careers) for more information.

There are also many courses where the skills you learn in A Level Maths may well be very useful (courses such as Geology, Architecture, Dentistry and Philosophy to name but a few), but it is not stated as a requirement. If you are in any doubt about the detail of this, please talk to a member of the Maths Department and to Ms Heath.

We would like you to study Maths because you enjoy it, not because you think you need it.

Mathematicians are not those who find maths easy, but those who enjoy how hard it gets."

M.Parker

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