A Level Further Maths
at The Warriner School

Further Mathematics A Level
Exam board: OCR – MEI Specification
Entry requirements: GCSE Mathematics at Grade 8* or above. (Students choosing Further Mathematics must also choose A Level Mathematics.)
*Students achieving a Grade 7 may be admitted at the discretion of the Maths Department.

Assessment structure: Formal exams taken at the end of Year 13.

This consists of four papers: one for pure maths content and one for each optional** unit covered. Choice of optional units may change each year, depending on the needs and interests of the teaching group.

> Paper 1:   Core Pure (2 hours 40 minutes)
> Paper 2:   Modelling With Algorithms (1 hour 15 minutes)**
> Paper 3:   Numerical Methods (1 hour 15 minutes)**
> Paper 4:   Extra Pure (1 hour 15 minutes)**

There will be a significant emphasis on problem solving, reasoning, and modelling and a requirement for the use of technology to permeate teaching and learning.

Core Pure offers students the opportunity to study fields of mathematics that are beyond the scope of the standard Mathematics A-level. This includes Complex Numbers (a number system developed from allowing the square root of negative numbers to be defined, also known as 'imaginary' numbers), Matrices (a multidimensional approach to algebra which allows for systems of equations to be handled simultaneously), Vectors methods and Calculus techniques.

Modelling With Algorithms has links with Computer Science and multiple applications in industry. This unit explores algorithms in their own right, as well as optimisation and network problems. Students will apply techniques learned at GCSE, and consider how real world problems can be modelled by algorithms .

Numerical Methods explores the approach to problems for which no exact algebraic methods exist. Students will learn how to use a spreadsheet to implement the methods and learn to analyse the errors associated with numerical methods.

Extra Pure goes beyond the Core Pure content to extend students' understanding of matrices by studying eigenvectors and eigenvalues. They will also study first and second order recurrence relations, be introduced to finite and infinite groups and extend their understanding of calculus to functions of two variables.

Skills required: The skills required for Further Mathematics are the same as those for Mathematics. In addition, Further Mathematicians will have a real passion for Maths, as well as a desire to gain a deeper understanding of often abstract mathematical concepts, and perhaps to go on to study Mathematics at a top university.

Future study avenues or careers: Although only a small number of degrees list Further Maths as essential (because not all schools and colleges are able to offer it as an A-level), there are many which consider it a useful facilitating subject. These include:

Actuarial Science	Aeronautical Engineering	Biochemistry	Biomedical Sciences	Chemical Engineering	Chemistry
Civil Engineering	Computer Science	Dentistry	Electronic Engineering	Law	Materials Science
Mathematics	Mechanical Engineering	Medicine	Optometry	Physics	Veterinary Science