**Mathematics Department**

**Purpose of study**

Mathematics is a creative and highly inter-connected discipline that has been developed

over centuries, providing the solution to some of history’s most intriguing problems. It is

essential to everyday life, critical to science, technology and engineering, and necessary

for financial literacy and most forms of employment. A high-quality mathematics education

therefore provides a foundation for understanding the world, the ability to reason

mathematically, an appreciation of the beauty and power of mathematics, a sense of

enjoyment and a curiosity about the subject.

**Key Stage 3**

Aims

Lessons are linked to the national curriculum for mathematics, which aims to ensure that all pupils:

* become fluent in the fundamentals of mathematics, including through varied and

frequent practice with increasingly complex problems over time, so that pupils develop

conceptual understanding and the ability to recall and apply knowledge rapidly and

accurately.

* reason mathematically by following a line of enquiry, conjecturing relationships and

generalisations, and developing an argument, justification or proof using mathematical

language.

* can solve problems by applying their mathematics to a variety of routine and non-routine

problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Year 7

The Year 7 scheme of work covers the following topics: number; algebra; ratio; geometry; probability; statistics

Year 8

The Year 8 scheme of work covers the following topics: number; algebra; ratio; geometry; probability; statistics

Year 9

The Year 9 scheme of work covers the following topics: number; algebra; ratio; geometry; probability; statistics

Further Information

Further information can be found at: <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239058/SECONDARY_national_curriculum_-_Mathematics.pdf>

**Key Stage 4**

Aims

Pupils follow a course of study which aims to prepare them for the examinations of the AQA course ‘GCSE Mathematics 8300’ at either Higher or Foundation tier.

Years 10 and 11

In Years 10 and 11 the subject content covers the following topics: number; algebra; ratio, proportion and rates of change; geometry and measures; probability; statistics.

Assessment

The Scheme of Assessment is linear with three question papers at each tier to be taken in the same examination series.

Further Information

Further information can be found at:

<http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300>

**Key Stage 5**

Aims

Students follow a course of study which is designed to prepare them for the relevant course(s) below.

Year 12

All maths students study the modules C1, C2 and S1 in order to take examinations for the qualification ‘Pearson Edexcel Level 3 Advanced Subsidiary GCE in Mathematics (8371)’.

Further mathematics students also study the modules S2, D1 and FP1 in order to take examinations for the qualification ‘Pearson Edexcel Level 3 Advanced Subsidiary GCE in Further Mathematics (8372)’.

Year 13

All maths students study the modules C3, C4 and M1 in order to take examinations for the qualification ‘Pearson Edexcel Level 3 Advanced GCE in Mathematics (9371)’.

Further mathematics students also study the modules M2, FP2 and FP3 in order to take examinations for the qualification ‘Pearson Edexcel Level 3 Advanced GCE in Further Mathematics (9372)’.

Summary of unit content:

C1: Algebra and functions; coordinate geometry in the (x, y) plane; sequences and

series; differentiation; integration.

C2: Algebra and functions; coordinate geometry in the (x, y) plane; sequences and

series; trigonometry; exponentials and logarithms; differentiation; integration.

C3: Algebra and functions; trigonometry; exponentials and logarithms;

differentiation; numerical methods.

C4: Algebra and functions; coordinate geometry in the (x, y) plane; sequences and

series; differentiation; integration; vectors.

FP1: Series; complex numbers; numerical solution of equations; coordinate

systems, matrix algebra, proof.

FP2: Inequalities; series, first order differential equations; second order differential

equations; further complex numbers, Maclaurin and Taylor series.

FP3: Further matrix algebra; vectors, hyperbolic functions; differentiation;

integration, further coordinate systems.

M1: Mathematical models in mechanics; vectors in mechanics; kinematics of a

particle moving in a straight line; dynamics of a particle moving in a straight

line or plane; statics of a particle; moments.

M2: Kinematics of a particle moving in a straight line or plane; centres of mass;

work and energy; collisions; statics of rigid bodies.

S1: Mathematical models in probability and statistics; representation and

summary of data; probability; correlation and regression; discrete random

variables; discrete distributions; the Normal distribution.

S2: The Binomial and Poisson distributions; continuous random variables;

continuous distributions; samples; hypothesis tests.

D1: Algorithms; algorithms on graphs; the route inspection problem; critical path

analysis; linear programming; matchings.

Assessment

All examination papers last 1 hour 30 minutes and are out of a total of 75 marks.

Further Information

Further information can be found at:

<http://www.edexcel.com/quals/gce/gce08/maths/Pages/default.aspx>