MATHS YEAR 7

Units Taught:

Autumn
Using numbers
Sequences
2D shapes
Decimals
Working with numbers

Spring
Averages and using data
Equations
Fractions
Angles
Graphs
Probability

Summer
Percentages
Symmetry
Linear equations
Interpreting data
3D shapes
Ratio

Main skills developed:

- Use positive integer powers and associated real roots
- Apply the four operations with decimal numbers
- Write a quantity as a fraction or percentage of another
- Use multiplicative reasoning to interpret percentage change
- Add, subtract, multiply and divide with fractions and mixed numbers
- Check calculations using approximation, estimation or inverse operations
- Simplify and manipulate expressions by multiplying a single term over a bracket
- Substitute numbers into formulae
- Solve linear equations in one unknown
- Understanding balance
- Using negative numbers
- Generating sequences and plotting linear equations

Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines

How parents can help to support their child's learning:

- Ensure that your child is always equipped with a pen, pencil, ruler and calculator
- Encourage the need for meeting homework deadlines
- Encourage the need to review their answers to check they are reasonable
- Encourage the need for revision to consolidate the topics taught

Students will be set fortnightly homework. This will be in the form of a computer based task.

The following websites can help your child's learning:

- **hegartymaths.com, vle.mathswatch.co.uk, corbettmaths.com and mrbartonmaths.com** (your child will have their own logins)

If you have any queries, please contact Ms D Davis

Extra-Curricular opportunities:

Websites: NRICH – Good problem-solving activities, Brilliant.org - Good problem-solving activities, DrFrostMaths – just for your interest – justifying the reasoning behind topics, Flowingdata.com – Stats for leisure. Magazines: https://chalkdustmagazine.com/

SMSC & British Values:

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. Mathematics therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Career Opportunities: Accountant, teacher, actuary, data analyst, investment analyst, engineering, statistician, finance, Astronomer, game designer.

MATHS YEAR 8

Units taught:

Autumn

Factors multiples and primes

Angles

Transformations

Probability

Percentages

Congruent shapes

Spring

Prisms

Graphs

Rounding

Interpreting data

Simplifying and expanding expressions

Summer

Congruence and scaling

Fractions and decimals

Proportion

Circles

Equations and formulae

Comparing data

Main skills developed:

- Convert numbers into standard form and vice versa
- Find a relevant multiplier when solving problems involving proportion
- Solve problems involving percentage change, including original value problems
- Factorise an expression by taking out common factors
- Solve linear equations with unknowns on both sides
- Plot and interpret graphs of linear functions
- Apply the formulae for circumference and area of a circle
- Calculate the gradient of a straight line
- Understand and use Pythagoras' Theorem
- Calculate volumes of 3D shapes
- Calculate speed, distance and time
- Use and draw venn diagrams

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MATHS YEAR 9

Units taught:

Autumn

Application of percentages

Equations and formulae

Polygons

Using data

Application of graphs

Pythagoras

Spring

Calculating with fractions

Algebraic manipulation

Applying standard form

Prisms and cylinders

Solving equations graphically

Compound units

Summer

Introduction to Trigonometry

More complex number skills

Ratio and proportion

Transformations

Applying probability

Main skills developed:

Whether taking the Foundation or Higher GCSE route, students will become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time. Subsequently students will develop their conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They will reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. Students will be given opportunities to show they 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.

How parents can help to support their child's learning:

- Ensure that your child is always equipped with a pen, pencil, ruler and calculator
- Encourage the need for meeting homework deadlines
- Encourage the need to review answers to check they are reasonable
- Encourage the need for revision to consolidate the topics taught
- Students will be set weekly homework. This will be in the form of a written task or computer based task.

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Career Opportunities: Accountant, teacher, actuary, data analyst, investment analyst, engineering, statistician, finance, Astronomer, game designer.

MATHS YEAR 10

Units taught:

Autumn Term	Spring Term	Summer Term
Solving quadratics algebraically	Trigonometry	Vectors
Limits of accuracy and surds	Functions and iteration	Algebraic proportion
Cumulative frequency and averages	Rearranging formulae	Histograms
Similar areas and volumes	Venn Diagrams	Density
Conditional probability	Fractions/Algebraic fractions	Pressure
Circle theorems	Linear graphs	End of Year Exam
Algebraic proportion	Pythagoras and Trigonometry in 3D	Recap of topics – Prep for Y11

Main skills developed:

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Career Opportunities:

Accountant, teacher, actuary, data analyst, investment analyst, engineering, statistician, finance, Astronomer, game designer.

MATHS YEAR 11

Units taught:

Autumn Term	Spring Term	Summer Term
Surds	Geometric proof	Topics identified from 2nd mock exam
Circle Theorems	Transformations of graphs	GCSE Exam Revision
Negative and fractional powers	Completing the Square	GCSE Exam Revision
Equations (including circles/tangents)	Revision for 1st Mock	GCSE EXAMS
Revision for 1st Mock	Topics identified from 1st mock exam	
	Revision for 2nd Mock	

Main skills developed:

Whether taking the Foundation or Higher GCSE route, students will become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time. Subsequently students will develop their conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They will reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. Students will be given opportunities to show they 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.

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MATHS YEAR 12

Units taught:

Autumn Term	Spring Term	Summer Term
Algebra and Functions	Integration	Exponentials
Measures of Spread	Coordinate Geometry	Logarithms
Representations of Data	Trigonometry	Kinematics
Coordinate Geometry	Hypothesis Testing	Forces and Motion
Differentiation	Vectors	Variable Acceleration
Correlation and Probability	Constant Acceleration	Recap of topics – Prep for End of Year Exam

Main skills developed:

A Level Mathematics is a broad and in depth course where you will study a number of elements of the most important areas of pure mathematics such as differentiation, integration, trigonometry and vectors, as well as learning about important mechanics and statistics based applications of mathematics. Through your studies, you will build on the mathematical skills learnt at GCSE with a particular focus on the development of:

- Mathematical argument, language and proof
- Mathematical problem solving
- Mathematical modelling

In year 12, we lay the groundwork in a range of pure topics. In addition to those mentioned above, you will cover algebraic expressions, quadratics, proof, graphs and transformations, exponentials and logarithms, and lines and circles. You also are introduced formally to A Level Mechanics – through the learning of kinematics, the constant acceleration formulae, and Newton's Laws – and A Level Statistics where you will further develop your GCSE knowledge of data representation/collection and probability, before learning about hypothesis testing and advanced measures of location and spread.

How parents can help to support their child's learning:

The following websites can help your child's learning:

- **physicsandmathstutor.com, alevelmathsrevision.com, themathsteacher.com, examsolutions.net, mrbartonmaths.com, hegartymaths.com**

If you have any queries, please contact Ms D Davis

Extra-Curricular opportunities:

Websites: **NRICH.maths.org** – Good problem-solving activities, **Brilliant.org** - Good problem-solving activities, **drfrostmaths.com** – just for your interest – justifying the reasoning behind topics, **Flowingdata.com** – Stats for leisure, **maths.org/step/** - preparation for some university courses.
Magazines: **https://chalkdustmagazine.com/**

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Career Opportunities:

A Level Mathematics is a valuable qualification for both employers and universities. It underpins a wide range of career opportunities in both science, technology, engineering and mathematics (STEM) and non-STEM fields. You may even find that you'll use your Maths skills in totally unrelated fields. Some exciting careers that could be open to you by studying A-Level Maths include:

Construction/architecture, engineering, medicine, scientific research, astronomer, teaching and tutoring, games development, accountancy, actuary, data analyst, investment analyst, statistician.

MATHS YEAR 13

Units taught:

Autumn Term	Spring Term	Summer Term
Algebraic Methods	Trigonometry	Numerical Methods
Functions and Graphs	Projectiles	Vectors
Radians	Application of Forces	Normal Distribution
Differentiation and Integration	Differentiation and Integration	A Level Exam Revision
Moments	Sequences and Series	A Level EXAMS
Forces and Friction	Correlation and Probability	

Main skills developed:

A Level Mathematics is a broad and in depth course where you will study a number of elements of the most important areas of pure mathematics such as differentiation, integration, trigonometry and vectors, as well as learning about important mechanics and statistics based applications of mathematics. Through your studies, you will build on the mathematical skills learnt at GCSE with a particular focus on the development of:

- Mathematical argument, language and proof
- Mathematical problem solving
- Mathematical modelling

In year 13, we build on the work undertaken in year 12 and study more abstract and challenging aspects of calculus and algebra in pure mathematics. In mechanics we develop knowledge of forces such as friction, as well as how to find moments. Finally, in statistics, we mature our knowledge of topics such as hypothesis testing and become expert analysts when it comes to data.

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