Mathematics Programme of Study: 2021-2022

Department Vision

The Maths department aims to provide all students with a rewarding and enjoyable experience of Mathematics. We will prepare students to become confident, numerate individuals who are able to deal with all aspects of Mathematics in their chosen career and in their adult life.

This will be accomplished through our commitment to excellent teaching, a well- designed curriculum with variety to motivate and engage students as part of our 'build a mathematician' ethos. We have high expectations of all students so that they will recognise and achieve their full potential. We aim to develop students with skills in analysis, reasoning, problem solving, creativity, collaboration, and resilience so that they can meet the mathematical problems they face with enthusiasm, curiosity and perseverance.

Curriculum Intent and Implementation

Our long-term aim is to produce an ambitious and connected curriculum accessible to all students from Year 7 to Year 13. We want pupils to become fluent in the fundamentals of mathematics, to be able to reason and to solve problems in line with the National Curriculum. To learn mathematics effectively, some topics have to be learned before others, and so we have carefully ordered our topics so students can build on prior knowledge and have as wide a variety of mathematical experiences as possible in each term and year. The six overarching topic areas in Maths are:

Number, Algebra, Geometry and Measure, Ratio & Proportion & Rates of Change, Statistics, and Probability.

Sub- topics within these areas of Maths are often revisited and linked to the concepts in other areas of the curriculum, making sure that topics are covered thoroughly so pupils experience variety as well as consolidation. Conceptual understanding is key and our lessons focus on small step learning, which also encourages deeper understanding so they can be built upon. Alongside concept and content, we also make links to a broad range of transferable skills for students to be:

Systematic, Thorough, Critical, Reflective, and Investigative.

As part of the disciplinary literacy policy in our school, the correct use of mathematical language and terminology is also taught. This helps develop confident learners of Maths through the skills of speaking, reading, listening and writing. Enrichment projects offer students an insight into how Maths links to other subjects such as Science to bring knowledge to life. After-school clubs aim to develop wider cultural awareness through puzzles and crafts showing the creative side to Maths as well as revision club. The more able take part in the UK Maths Challenge.

Our curriculum not only covers all the content of the National Curriculum, GCSE and A level courses, but also provides pedagogic advice for teachers through joint planning and sharing of resources to suit the needs of each class.

Discovery KS3- Curriculum Summary (Year 7-9)

Our Discovery Scheme of Work (SOW) is designed entirely on the DfE National Curriculum framework. We have structured this specification into 16 units of work. This spiralling SOW enables our students to build confidence and retention through repetition, mastery and extension of knowledge. The SOW is intended to build firm foundations for Destiny (KS4- GCSE) by deepening students' knowledge, understanding and confidence.

Our medium term plans ensure that our students have access to every unit in the framework. These units have been further divided into three stages to support differentiation when planning to ensure ambition and challenge. Every teacher is able to see the scope of each unit so that there is no ceiling on learning. Students have 5 x 70mins lessons per fortnight in year 7 and 8 and 6 x 70mins in year 9.

YEAR 7	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Student learn the content and skills under these topic areas:	8. Statistics 1.Whole number and decimal calculations 3. Algebra 13. Sequences	11. Factors and Multiples 2. 2D- shapes	4. Fractions, Decimals, Percentages 15. Ratio & Proportion	5. Angles 16. Probability 10. Equations	9. Transformations 14. 3D-shapes 7. Place Value	12. Construction Project Work: Mean Doll
Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS2 and prepare students for KS4. Therefore, topics repeat from year to year for consolidation and fluency. Students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions.					

Assessment	Students are assessed on the topics covered so far at each whole-school assessment point. The 2nd and 3rd assessment in the year assess students on the topics covered since the previous assessment as well as a few questions on misconceptions from the previous assessment. This is for interleaving practice and long term retention in preparation for GCSE style exams. When assessments are coming up, a detailed revision list is shared with key words.					
YEAR 8	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Student learn the content and skills under these topic areas:	1. Whole number & decimal calculation 5. Angles 3. Algebra 13. Sequences	11. Factors and Multiples 2. 2D- shapes	4. Fractions, Decimals & Percentages 15. Ratio & Proportion	8. Statistics 16. Probability 10. Equations	6. Graphs 9. Transformations 7. Place Value	12. Construction Project Work: Recycling .
Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS2 and prepare students for KS4. Therefore, topics repeat from year to year. Students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions. When assessments are coming up, a detailed revision list is shared with key words.					
Assessment	Students are assessed on the topics covered so far at each whole-school assessment point. The 2nd and 3rd assessment in the year assess students on the topics covered since the previous assessment as well as a few questions on					

	misconceptions from the previous assessment. This is for interleaving practice and long term retention in preparation for GCSE style exams. When assessments are coming up, a detailed revision list is shared with key words.					
YEAR 9	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Student learn the content and skills under these topic areas:	7. Place Value 5. Angles 3. Algebra 6. Graphs	11. Number Properties 2. 2D- shapes	4. Fractions, Decimals, Percentages 15. Ratio & Proportion	8. Statistics 16. Probability 10. Equations	KS4 Transition Work: Pythagoras Quadratics Indices Trigonometry	Bespoke revision and repetition of topics as necessary Project Work: Swimming Pool
Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS2 and prepare students for KS4. Therefore, topics repeat from year to year. Students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions. When assessments are coming up, a detailed revision list is shared with key words.					
Assessment	Students are assessed on the topics covered so far at each whole-school assessment point. The 2nd and 3rd assessment in the year assess students on the topics covered since the previous assessment as well as a few questions on misconceptions from the previous assessment. This is for interleaving practice and long term retention in preparation for GCSE style exams. When assessments are coming up, a detailed revision list is shared with key words.					

Discovery KS3- Curriculum Enhancement

- Enrichment projects
- Number Day
- Pi Day
- Star Wars Day
- Maths Assemblies
- Junior Maths Challenge

Destiny - KS4 Curriculum Summary (Year 10-11)

Exam board and Specification details:
EDEXCEL 1MA1- Higher and Foundation entries are available (100% exams, no coursework)
3 exam papers are sat at the end of the 2-year course, each 90mins long.
Paper 1 is a non-calculator and papers 2 and 3 allow the use of a calculator.

Assessment objectives:
AO1- Use and apply standard techniques - 40% at Higher and 50% at foundation
AO2- Reason, interpret and communicate mathematically- 30% at Higher and 25% at foundation
AO3- Solve problems within mathematics and in other contexts-30% at Higher and 25% at foundation

Year 10 is the year that helps the students make that link from KS3 to KS4 Maths. The emphasis is to connect the skills and knowledge as well as help develop techniques for GCSE-style problems at foundation level. The teaching is geared to help students bridge between single answer questions to those that require more reading and interpretation so that the appropriate Maths is used to solve the question and real-life problems in context. Every student is stretched with their GCSE journey in mind. Our medium term plans ensure that our students have access to every unit in the exam board specification, which is taught in a linear fashion. In other words, these units are not repeated and build on KS3 teaching. These units have been further divided into smaller stages to support differentiation when planning to ensure ambition and challenge. Every teacher is able to see the scope of each unit so that there is no ceiling on learning. We aim for students to have confidence and competence with mathematical content so that they can apply it flexibly to solve problems.

Students have 7 x 70mins lessons per fortnight in year 10 and 6 x 70mins in year 11. The catch-up programme this year has been integrated into PREP time for Maths with 2 x 30mins per week for Year 11.

YEAR 10	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Higher Tier	1a.Calculations, checking, rounding 1c. Factors, multiples, primes, standard form, surds 2a. Algebra Basics, setting up, solving, rearranging 6b. Linear graphs and coordinate geometry	6c. Quadratic, Cubic and other graphs 7a. Perimeter, Area, Volume 7b. 3D forms, volume, cylinder, cones, spheres	7c. Accuracy and bounds 8a. Transformations 8b. Construction, loci and bearings	9a. Solving quadratic and simultaneous equations 9b. Inequalities	11.Multiplicative Reasoning 10.Probability	12. Similarity & Congruence in 2D and 3D
YEAR 10	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Foundation Tier	1a. Integers and Place Value 1d. Factors, Multiples & Primes 2a. Algebra Basics 2b. Expressions, Substitution & Formula 7. Statistics, sampling and averages	8. Perimeter, Area and Volume 9a. Real Life Graphs	9b. Straight line graphs 10. Transformations	11a. Ratio 11b. Proportion	11. Multiplicative Reasoning 12. Right-angled triangles, Pythagoras and Trigonometry	13. Probability

Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS3 and prepare students for KS4. Topics are taught in a linear fashion and not repeated because they build on KS3 knowledge. To help with retention and building confidence, students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions. When assessments are coming up, a detailed revision list is shared with key words.					
Assessment		**Mock GCSE Assessment on topics covered so far**		**Mock GCSE Assessment on topics covered so far**		**Mock GCSE Assessment on topics covered so far**
YEAR 11	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Higher Tier	5b. Pythagoras & Trigonometry 13b. Further Trigonometry 14a. Collecting Data	14b. Cumulative Frequency & Box Plots, and Histograms 15. Quadratics, expanding brackets, sketching graphs, graphs of circles and cubics. 16a. Circle Theorems 17. Changing the subject of a formula, algebraic fractions, solving equations arising form fractions, rationalising	17. Changing the subject of a formula, algebraic fractions, solving equations arising form fractions, rationalising surds, proof 18. Vectors and geometric proof 19a. Reciprocal and exponential Graphs, gradients, area and under curve	19b. Direct and indirect proportion Bespoke revision to meet the needs of the class based on student surveys	Bespoke revision to meet the needs of the class based on student surveys	External Exams

		surds, proof				
YEAR 11	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Foundation Tier	6. Properties of Shape, parallel lines, angle facts 13. Probability 14. Multiplicative Reasoning	15a. Plans and elevations 15b. construction , loci, and bearings 16a. Quadratic Equations, Expanding and factorising 16b. Quadratics Equations and Graphs 17. Circles, cylinders, cones, spheres 18a. Fractions, and reciprocals	18a. Fractions, and reciprocals 18b. Indices and standard form 19a. Similarity and congruence in 2D 19b. Vectors	20. Rearranging equations, graphs of cubis, and reciprocal functions and simultaneous equations Bespoke revision to meet the needs of the class based on student surveys	Bespoke revision to meet the needs of the class based on student surveys	External Exams
Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS3 and prepare students for KS4. Topics are taught in a linear fashion and not repeated because they build on KS3 knowledge. To help with retention and building confidence, students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions. When assessments are coming up, a detailed revision list is shared with key words.					
Assessment	**Mock GCSE Assessment on**		**Full mock GCSE exams**	**Full mock GCSE exams**		

	topics covered so far					

Destiny KS4- Curriculum Enhancement

- Maths Gym every Tuesday for support and revision
- Number Day
- Pi Day
- Star Wars Day
- Maths Assemblies
- Intermediate Maths Challenge

EPCS6 - KS5 Curriculum Summary (Year 12-13)

Exam board and Specification details:
EDEXCEL 8MA0 and 9MA0 (100% exams, no coursework)
AS - there are 2 exam papers. A pure exam is 2hours long and an Applied paper is 90mins long including both Statistics and Mechanics
A2 - there are 4 exam papers. 2 Pur exams 2hours each and 2 applied papers 90mins each.

Assessment objectives:
AO1- Use and apply standard techniques- 60% at AS level, 50% as A2 level
AO2- Reason, interpret and communicate mathematically- 20% at AS level, 25% as A2 level
AO3- Solve problems within mathematics and in other contexts-20% at AS level, 25% as A2 level

Year 12 is the year that helps the students make that link from KS4 to KS5 Maths. The emphasis is to connect the skills and knowledge as well as help develop techniques for A Level-style problems. The teaching is geared to help students bridge betweenGCSE questions to those that require more reading and interpretation so that the appropriate Maths is used to solve the question and real-life problems in context. Every student is stretched with their A level journey in mind. Our medium term plans ensure that our students have access to every unit in the exam board specification, which is taught in a linear fashion. In other words, these units are not repeated and build on KS4 teaching. These units have been further divided into smaller stages to support differentiation when planning to ensure ambition and challenge. Every teacher is able to see the scope of each unit so that there is no ceiling on learning. We aim for students to have confidence and competence with mathematical content so that they can apply it flexibly to solve problems.

Students have 7 x 70mins lessons per fortnight in year 12 and year 13. The course is divided up according to the number of teachers specialised to teach the different disciplines in the subject: pure, statistics, mechanics. This year there are 2 teachers sharing the pure aspect 2:3 and 2 teachers sharing the applied aspects 1:1. This makes up the 7 lessons in total and students are taught the full course to cater for their post-18 plans for continuing into further education and linking Maths to the wide variety of courses at University level.

YEAR 12	Pure Maths	Applied Maths

AS Mathematics Year 1	1. Algebraic Expressions 2. Quadratics 3. Equations & inequalities 4. Graphs & Transformations 5. Straight Line Graphs 6. Circles 7. Algebraic Methods 8. Binomial Expansion 9. Trigonometric Ratios 10. Trigonometric Identities & Equations 11. Vectors 12. Differentiation 13. Integration 14. Exponentials & Logarithms			Statistics: 1. Data collection 2. Measures of Location & Spread 3. Representation of Data 4. Correlation 5. Probability 6. Statistical Distributions 7. Hypothesis Testing Mechanics: 8. Modelling in Mechanics 9. Constant Acceleration 10. Forces & Motion 11. Variable Acceleration		
Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS43 and prepare students for KS5. Topics are taught in a linear fashion and not repeated because they build on KS4 knowledge. To help with retention and building confidence, students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions. When assessments are coming up, a detailed revision list is shared with key words.					
Assessment	**Mock AS Assessment on topics covered so far**	**Mock AS Assessment on topics covered so far**				**End of Year 12 full AS mock exam**
YEAR 13	**Pure Maths**			**Applied Maths**		
A2 Mathematics Year 2	1. Algebraic Methods			Statistics:		

	2. Functions & Graphs 3. Sequences & Series 4. Binomial Expansion 5. Radians 6. Trigonometric Functions 7. Trigonometry & Modelling 8. Parametric Equations 9. Differentiation 10. Numerical Methods 11. Integration 12. Vectors	Regression, Correlation & Hypothesis Testing 1. Conditional Probability 2. The Normal Distribution Mechanics: 3. Moments 4. Forces & Friction 5. Projectiles 6. Applications of Forces 7. Further Kinematics
Students learn how to:	Each topic in Maths contains many sub-topics and skills. As we go up in the year groups, these topics become more in-depth and build on prior knowledge from KS43 and prepare students for KS5. Topics are taught in a linear fashion and not repeated because they build on KS4 knowledge. To help with retention and building confidence, students regularly review their learning with knowledge recall starters, interleaving homework tasks and self-assessment of classwork with discussions on misconceptions. When assessments are coming up, a detailed revision list is shared with key words.	

Assessment	**Mock A2 Assessment on topics covered so far**	**Mock A2 Assessment on topics covered so far**				**External A2 Exams**

EPCS6 KS5- Curriculum Enhancement:

- Maths Gym every Tuesday for support and revision
- Workshops in school holidays
- Senior Maths Challenge
- Cross Curricular links to Science, Physics
- Links with AMSP (Advanced Maths Support Programme)