Mathematics Programme of Study: 2023-2024

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:	1.Whole number and decimal calculations 7. Place Value	5. Angles 3. Algebra	3. Algebra 4. Fractions, Decimals, Percentages 13. Sequences	13. Sequences 2. 2D- shapes 10. Equations	11. Factors, Multiples, Primes, Powers, Roots 15. Ratio & Proportion	8. Statistics 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 7. Place Value 5. Angles	11. Factors and Multiples 3. Algebra 4. Fractions, Decimals & Percentages	3. Algebra 4. Fractions, Decimals & Percentage	15. Ratio & Proportion 2. 2D- shapes 8. Statistics	8. Statistics 16. Probability	14. 3D shapes 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:	9. Transformations 5. Angles	11. Number Properties 10. Equations	4. Fractions, Decimals, Percentages 15. Ratio & Proportion	2. 2D- shapes	Transition into GCSE: 1a.Integers, Place Value, 1b. Decimals, rounding, 1c. indices, powers, roots, (Higher- standard form, surds) 1d. factors, multiples, primes, 2a. Algebra basics(Higher-set-up and solve, rearrange)	Transition into GCSE: 2b. Expressions, substitution, formulae (Higher-sequences)
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: mean doll, recycling
- Number Day
- Pi Day
- Star Wars Day
- Maths Assemblies
- Junior Maths Challenge
- Careers week

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

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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 8 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
Foundation Tier	3a. Tables, charts, graphs 3b. pie charts 3c. Scatter Graphs 4a. Fractions, decimals, percentages 4b. Percentages	4b. Percentages 5a. Equations and Inequalities 5b. Sequences 6. Properties of shape, parallel lines, angle facts	7. Statistics, sampling, averages 8. Perimeter, area and volume (without circles) 9b. Straight line graphs	9a. Real life graphs 10. Transformations	11a. Ratio 11b. Proportion 13. Probability	14. Multiplicative Reasoning 15a. Plans and Elevations
YEAR 10	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Higher Tier	3a. Averages and range (and tables) 3b. Representing, interpreting data and scatter graphs	4b. Ratio & Proportion 5a. Polygons, angles and parallel lines	6b. Linear Graphs and coordinate geometry 6a. Graphs: the basics and real life graphs	7a. Perimeter, area, volume 7b. 3D forms, volume, cylinders, cones, spheres	7c. Accuracy & Bounds 8b. Construction & Loci 9a. Solving Quadratics and simultaneous equations	9a. Solving Quadratics and simultaneous equations 9b. Inequalities

	4a. Fractions, decimals, percentages	5b. Pythagoras and Trig	6c. Quadratic, Cubic and other graphs			
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**
Foundation Tier	12. Right angled triangles, pythagoras, trigonometry 14. Multiplicative Reasoning 15a. Plans and Elevations	15a. Plans and Elevations 15b. Construction, Loci, Bearings 16a. Quadratic Equations	17. Circles, cylinders, cones, spheres 18a. Reciprocals and fractions 18b. Indices and standard form	19a. Similarity and congruence in 2D 19b. Vectors 20. Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations	Bespoke Revision	Bespoke Revision Study Leave after all 3 papers have occurred. Y11 into 12 A'level bridging days

| | | expanding and factorising

16b. Quadratic Equations & Graphs | | | | |
|---|---|---|---|---|---|---|

YEAR 11	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Higher Tier	8a. Transformations

8b. Construction, loci, bearings

12. Similarity and congruence in 2D and 3D shapes | 6a. Graphs: basics and real life

6b. Linear graphs and coordinate Geometry

13. Graphs of Trig functions

13b. Further Trig | 10. Probability

18. Vectors and geometric proof

14a. Collecting data , inc Histograms | 11. Multiplicative Reasoning

17. Changing the subject, algebraic fractions, equations arising from fractions, rationalisng surds, proof

19a. Reciprocal and exponential graphs, gradient and under a curve | Bespoke Revision | Bespoke Revision

Study Leave after all 3 papers have occurred.

Y11 into 12 A'level bridging days |
| *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. | | | | | |
| **Destiny KS4- Curriculum Enhancement** | | | | | | |

- Easter Holiday and Saturday workshop for support and revision
- Number Day
- Pi Day
- Star Wars Day
- Maths Assemblies
- Intermediate Maths Challenge
- Careers Week

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 built 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 (66%)	Applied Maths (16.6% each)

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. Modeling 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.	
YEAR 13	Pure Maths (66%)	Applied Maths (16.6% each)

A2 Mathematics Year 2	1. Algebraic Methods
	2. Functions & Graphs
	3. Sequences & Series
	4. Binomial Expansion
	5. Radians
	6. Trigonometric Functions
		Statistics:
		Regression, Correlation & Hypothesis Testing
		  1. Conditional Probability
		  2. The Normal Distribution
		Mechanics:
		  3. Moments

	7. Trigonometry & Modelling 8. Parametric Equations 9. Differentiation 10. Numerical Methods 11. Integration 12. Vectors	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.	

EPCS6 KS5- Curriculum Enhancement:

- Easter Holiday and Saturday workshops for support and revision
- Workshops in school holidays
- Senior Maths Challenge
- Cross Curricular links to Science, Physics
- Links with AMSP (Advanced Maths Support Programme)