Mathematics Curriculum Map

Curriculum Intent

The curriculum has been designed to empower children with virtues that enable them to excel academically and spiritually inspiring them to serve humanity selflessly (Nishkam), with an abundance of love, compassion and forgiveness. The curriculum aims to support students to learn about peace, forgiveness, love and faith in the Divine through their academic subjects, faith practice and personal development.

Our curriculum is constructed around our vision to ensure we remain:

Faith-inspired: learning from the wisdom of religion
Our students explore the divine context of humanity and wonder of all creation. They not only learn about, but also learn from, the wisdom of religions and in so doing explore the infinite human potential to do good unconditionally. We support students to develop aspects of their own religious, spiritual or human identities. They learn about serenity through prayer and humility in service and in so doing, they deepen their own respective faith, and respect the common purpose of all religious traditions, as well as respecting the beliefs of those with no faith tradition. They explore the unique divinity of the individual, and our common humanity.

Virtues-led: nurturing compassionate, responsible human beings
We believe that the fostering of human virtues forms the foundation of all goodness. Our curricula are carefully enriched to allow experiences where our students, teachers and parents alike learn to grow through a conscious focus on virtues. Our virtues-led education approach helps to provide guidance to enable studr ents to understand their choices in order to help lead better lives. Our students become self-reflective and flourish; they are able to build strong, meaningful relationships and understand their responsibilities to the global family and all creation, founded in faith. Students learn to experience faith through lived out through righteous living in thought, action and deed.

Aspiring for Excellence: in all that we do.
Our students and staff alike aim to become the best human beings they can possibly be, in all aspects of spiritual, social, intellectual and physical life. We foster a school culture which inspires optimism and confidence, hope and determination for all to achieve their best possible. This is accomplished through a rich and challenging curriculum, along with excellent teaching to nurture awe and wonder. Students gain a breadth and depth of knowledge and a love of learning to achieve their full potential.
The curriculum at Nishkam School West London has been carefully crafted to be broad, balanced and stimulating, giving every Nishkam student the opportunity to be knowledgeable, multi-skilled, highly literate, highly numerate, creative, expressive, compassionate and confident people. Knowledge-rich, skills based and Faith-inspired, the Curriculum at Nishkam School West London is delivered through three **Golden Threads** that are unique to our ethos and virtues:

1	Love and forgiveness vs. Enmity and Hate
2	Peace and Collaboration vs. Conflict and War
3	Trust in God

Every composite of our curriculum is constructed of components that have each of these threads at their core. These elements can be clearly identified in our subject-based curriculum maps and Schemes of Learning documents.

We believe that students deserve a creative and ambitious mathematics curriculum, rich in skills and knowledge, which ignites curiosity and prepares them well for everyday life and future employment. The curriculum is necessarily aspirational, focused on excellence and on securing in all learners a love of learning through the acquisition of knowledge, the study and practice of faith, and an understanding of the world around them. One aspect of the curriculum is the school ethos of the golden threads. Students will learn via collaboration, peace, forgiveness, and love through each unit of work.

Our pedagogy is based on a mastery approach to the teaching of mathematics. We believe in variation to develop a deep and holistic understanding via procedural fluency and repetition of key facts to free up working memory. The concepts in the curriculum are interleaved to ensure that students revisit previously learnt concepts in order to build new learning upon this. Within lessons, concepts are broken down into small, connected and structured steps enabling application in a variety of contexts. We will use manipulatives and multiple representations to build and scaffold learning. Teachers plan intelligent questions into their lessons to check for student understanding and marking of student work informs teachers' planning. Students develop a growth mindset through our mathematics curriculum enabling them to be resilient when they make mistakes.

Curriculum Implementation:

At NSWL, students follow the National Curriculum programme of student which ensures that our students cover a wide breadth of mathematical concepts. The key strands which are covered in our curriculum include:

- Number
- Algebra
- Ratio and Proportion
- Geometry
- Measure
- Probability
- Statistics

Each strand is broken down into key topics which are then separated into a sequence of learning objectives which each class moves through at the correct pace for the students.

The curriculum aims to develop a number of mathematical skills which are based on the GCSE qualification objectives. These skills are to:

1. Develop fluent knowledge, skills and understanding of mathematical methods and concepts
2. Acquire, select and apply mathematical techniques to solve problems
3. Reason mathematically, make deductions and inferences, and draw conclusions
4. Comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

Being an all-through school allows for a smoother transition between KS2 to KS3 by collaborating with the primary maths lead and the students to harmonise the primary and secondary curriculum. During KS3 our students' study all these topics each year, in ever-increasing depth and complexity to develop fluency in the fundamentals of mathematics. Repetition and practice help to promote recall and application of knowledge which will be required to access more complex problems in KS4. By ensuring the fundamentals are embedded during KS3 we create a solid platform on which to build in KS4, with a focus on application of content to complex problems.

For those that have not yet mastered the fundamentals there is a continued emphasis on repetition of key concepts and in-depth understanding. However, for the more able students, the scheme of learning is designed so that key concepts are recapped quickly before spending more time exposing students to applied questions to develop depth of understanding and problem-solving techniques. From the schemes of learning, teachers are able to choose the starting point for each unit depending on the needs and the ability of the class. This means that each year students revisit a topic, they start further along the progression through that topic. Class sizes get smaller as you move through the sets in secondary phase to provide the support that is needed for students to reach their target grades.

Progression of Knowledge & Skills

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Match sort, compare amounts Compare size, mass & capacity Exploring pattern Representing, comparing, composition 1,2,3	Positional language Representing numbers to 5 One more, one less Shape with 4 sides Time Circles and triangles	Introducing zero Comparing numbers to 5 Composition of 4&5 Comparing mass Comparing capacity 6,7 & 8	Making pairs Length & height Time Counting to 9 & 10 Comparing numbers to 10 Bonds to 10	Building Numbers Beyond 10 Counting patterns Beyond 10 Spatial reasoning- Match, rotate, Manipulate Adding more	Doubling Sharing & grouping Even & Odd Spatial Reasoning – Visualise and build Deepening understanding

			Combing 2 amounts, making pairs	3D shape pattern Spatial awareness Patterns	Taking Away Spatial reasoning - 2 Compose, decompose	Patterns and relationships Spatial Reasoning – Mapping
Year 1	Place Value within 10 Addition and Subtraction within 10	Addition and Subtraction within 10 Geometry: Shape	Place Value within 20 Addition and Subtraction within 20	Place Value within 50 Length and Height Mass and Volume	Multiplication and Division Fractions Position and Direction	Place Value within 100 Money Time
Year 2	Place Value Addition and Subtraction	Addition and Subtraction Shape Money Multiplication and Division	Multiplication and Division Length and Height Mass, capacity and temperature	Consolidation Fractions Time	Statistics Position and Direction	Consolidation -Number bonds within 10 for calc within 20 -Money -2D and 3D shapes -Adding and Subtracting on a number line
Year 3	Place Value Addition and Subtraction	Addition and Subtraction Multiplication and Division	Multiplication and Division Length and Perimeter	Fractions Mass and Capacity	Fractions Money Time	Time cont. Shape Statistics
Year 4	Place Value Addition and Subtraction	Area Multiplication and Division	Multiplication and Division Length and Perimeter	Fractions Decimals A	Decimals Money Time	Shape Statistics Position and Direction

Year 5	Place Value Addition and Subtraction	Multiplication and Division Fractions	Multiplication and Division Fractions	Decimals and Percentages Perimeter and Area Statistics	Shape Position and Direction Decimals	Decimals cont. Negative Numbers Converting Units Volume
Year 6	Place Value Addition, Subtraction, Multiplication and Division	Fractions Fractions Converting Units	Ratio Algebra Decimals	Fractions, Decimals and Percentages Area, perimeter and volume Statistics	Shape Position and Direction	Trust Project Enterprise – Fiver Challenge Secondary transition unit (Algebra, Negative Numbers and calculator work)
Year 7	We start the Year by building on the Primary – Secondary Transition curriculum which is completed in June/July by Year 6 Teachers. We begin with Number: • Negative Numbers • BIDMAS • HCF & LCM • Squares/Roots • Rounding • Estimation • Index Laws • Standard Form • Fractions • Decimals	Autumn 2 further builds on the Transition SoL by exploring Algebraic concepts in more detail: • Operations with Algebraic Expressions • Forming & Solving Equations • Expanding Brackets • Linear and quadratic Factorisation • Changing the Subject • Substitution	Spring 1 introduces ratios. Number and Algebra also feature in this term to strengthen problem solving skills: • Percentages • FDP • Introduction to Ratios • Ratio and Proportion • Sharing Ratios • Combining Ratios • Linear Inequalities • Solving Inequalities	Spring 2 builds on Algebraic and number skills, deepening understanding by involving algebra with shapes: • Area • Perimeter • Converting Metric Units • Volume of Shapes • Angles in Parallel Lines	In the Summer Term, we shift to graphs and coordinate geometry. This is vital to reinforce the base concepts learnt throughout the year, through visualisation: • Linear Graphs • Gradient • Equation of lines – Parallel and Perpendicular • Real Life Graphs • Quadratic Graphs	In Summer 2, we prepare for content that will be learnt by students in Year 8, whilst strengthening the algebra taught in Y7: • Area and Circumference of circles • Area of Compound Shapes • Simultaneous Equations • Sequences • Pythagoras • Angles in Polygons
Year 8	**Unit 1: NUMBER** • Place Value • Decimals • Rounding • Estimation • HCF & LCM	**Unit 2: ALGEBRA** • Algebraic Indices • Expanding and Factorising • Linear and Quadratic Factorisation	**Unit 3: INTERPRETING AND REPRESENTING DATA** • Averages – Mean, Median, Mode, Range • Frequency Tables	Continuation of **Unit 4**: • Ratios • Scaling up ratio – exchange rates • Proportion • Scales and Maps	**Unit 6: GRAPHS** • Line Segments • Linear Graphs and Equations • Quadratic Graphs	Continuation of **Unit 7:** • Units and Accuracy • Prisms • Circles • Sectors of Circles

	• Zero, negative and Fractional Indices • Standard Form • Surds • Combinations	• Solving Equations • Substitution • Linear Sequences and nth term • Formulae	• Collecting Data • Statistical Diagrams (Representing/interpretating Data) • Time Series • Scatter Graphs **Unit 4: FRACTIONS, RATIO AND PERCENTAGE** • Fractions • Decimals • Percentages – Reverse, change and compound.	**Unit 5: ANGLES AND TRIGONOMETRY** • Angle properties of Triangles and Quadrilaterals • Angles in Parallel Lines • Interior Angles in Polygons • Exterior Angles in Polygons • Pythagoras • Trigonometry	• Harder Graphs: Cubic, Reciprocal, Exponential • Real-Life Graphs **Unit 7: AREA AND VOLUME** • Perimeter and Area (parallelogram, trapezium and compound shapes including polygons)	• Cylinders and Spheres • Pyramids and Cones **Unit 8: TRANSFORAMTION AND CONSTRUCTION** • 3D Solids – plan and elevations • Reflections and Rotations • Enlargement • Transformation Combinations • Bearings and Scale Drawings • Constructions • Loci
Year 9	**Unit 9: EQUATIONS AND INEQUALITIES** • Quadratic Equations - Factorising • Quadratic Formula • Completing the Square • Linear Simultaneous Equations • Quadratic Simultaneous Equations • Linear Inequalities **Unit 10: PROBABILITY** • Calculating probabilities • Mutually exclusive events • Experimental Probability • Combined Events • Independent events and tree diagrams • Conditional Probability	**Unit 10**: • Venn Diagrams and Set Notation • Growth and Decay • Compound Measures • Ratio and Proportion **Unit 11: MULTIPLICATIVE REASONING** • Growth and decay percentages • Compound measures • Ratio and proportion	**Unit 12: SIMILARITY AND CONGRENCE** • Congruence • Similarity in 2D Shapes • Similarity in 3D shapes **Unit 13: TRIGONOMETRY 2** • Accuracy • Graphs of Sine, Cosine and Tangent functions • Cosine Rule with 2D/3D Shapes • Pythagoras with 2D/3D Shapes	Continuation of **Unit 13:** • Transforming Trigonometric Graphs **Unit 14: FURTHER STATISTICS** • Sampling • Cumulative Frequency • Stem and leaf • Box Plots • Histograms	**Unit 15: EQUATIONS AND GRAPHS 2** • Solving Simultaneous Equations Graphically • Representing Inequalities Graphically • Solving Quadratic Equations Graphically • Graphs of Quadratic Functions • Graphs of Cubic Functions **Unit 16: CIRCLE THEOREMS** • Radii and Chords • Tangents • Angle Theorems in Circles • Applying Circle Theorems	Continuation of **Unit 16:** • Construction – graph of a circle • Equation of a tangent **Unit 17: ALGEBRA 2** • Rearranging Formulae • Algebraic Fractions • Simplifying Algebraic Fractions • Surds • Solving Algebraic Fraction Equations • Functions

Year 10	**Unit 15: EQUATIONS AND GRAPHS 2** • Solving Simultaneous Equations Graphically • Representing Inequalities Graphically • Solving Quadratic Equations Graphically • Graphs of Quadratic Functions • Graphs of Cubic Functions **Unit 16: CIRCLE THEOREMS** • Radii and Chords • Tangents • Angle Theorems in Circles • Applying Circle Theorems	Continuation of **Unit 16:** • Construction – graph of a circle • Equation of a tangent **Unit 17: ALGEBRA 2** • Rearranging Formulae • Algebraic Fractions • Simplifying Algebraic Fractions • Surds • Solving Algebraic Fraction Equations • Functions	**Unit 18: VECTORS AND GEOMETRIC PROOF** • Vectors and vector notation • Vector arithmetic • Parallel vectors and collinear points • Solving geometric problems **Unit 19: PROPORTION AND GRAPHS** • Direct proportion • Inverse proportion	Continuation of **Unit 19:** • Functions • Exponential functions • Non- linear graphs • Translating graphs of functions • Reflecting and stretching graphs of functions	**UNIT 1 TO 9 (Round 2)** Consolidate key concepts by: • Increased challenge through higher order thinking skills, problem-based learning with real-world applications, include meta – cognition and reflection, introducing connections between topics which involve multistep tasks to deepen understanding. • Exam focused skills including retrieval practise, timed responses and model answers to exam questions.	
Year 11 - HIGHER	**UNIT 10 TO 15 (Round 2)** Consolidate key concepts by: • Increased challenge through higher order thinking skills, problem-based learning with real-world applications, include meta – cognition and reflection, introducing connections between topics which involve multistep tasks to deepen understanding. • Exam focused skills including retrieval practise, timed responses and model answers to exam questions.		**UNIT 16 TO 19 (Round 2)** Consolidate key concepts by: • Increased challenge through higher order thinking skills, problem-based learning with real-world applications, include meta – cognition and reflection, introducing connections between topics which involve multistep tasks to deepen understanding. • Exam focused skills including retrieval practise, timed responses and model answers to exam questions.		**Revision** Bespoke KAT identified topics where 2 lessons each week are based on Exam packs and exam skills.	
Year 11 - FOUNDATION	**Unit 1 – 5 Foundation** Consolidate Key concepts by:	**Unit 6 – 10 Foundation** Consolidate Key concepts by:	**Unit 11 – 15 Foundation** Consolidate Key concepts by:	**Unit 16 – 19 Foundation** Consolidate Key concepts by:	**Revision** Bespoke KAT identified topics where 2 lessons each week are based on Exam packs and exam skills.	

	• Using diagnostic assessments to identify key weaknesses, prioritise high impact topics from the units, clear identification of grade 4 and 5 topics, teach using retrieval practise, spaced revision and interleaving, visual adds – formula sheet. • Complete past papers effectively using exam skills including retrieval practise, timed responses and model answers to exam questions.	• Using diagnostic assessments to identify key weaknesses, prioritise high impact topics from the units, clear identification of grade 4 and 5 topics, teach using retrieval practise, spaced revision and interleaving, visual adds – formula sheet. • Complete past papers effectively using exam skills including retrieval practise, timed responses and model answers to exam questions.	• Using diagnostic assessments to identify key weaknesses, prioritise high impact topics from the units, clear identification of grade 4 and 5 topics, teach using retrieval practise, spaced revision and interleaving, visual adds – formula sheet. • Complete past papers effectively using exam skills including retrieval practise, timed responses and model answers to exam questions.	• Using diagnostic assessments to identify key weaknesses, prioritise high impact topics from the units, clear identification of grade 4 and 5 topics, teach using retrieval practise, spaced revision and interleaving, visual adds – formula sheet. • Complete past papers effectively using exam skills including retrieval practise, timed responses and model answers to exam questions.		
Year 12 A Level Mathematics	Students start by covering the crossover content from the GCSE. This means sharpening up algebraic skills in functions and quadratics in pure maths, and sampling, Venn diagrams and tree diagrams in statistics. New content from the A-level includes the equation of a circle in pure maths and measures of central tendency and variation in statistics. • Quadratics • Indices • Functions • Graph transformations	The second half-term sees students delving deeper into the A-level content proper. In Pure mathematics students extend their knowledge of trigonometry while in statistics they learn important new statistical distributions and how to conduct hypothesis tests. Students finish statistics at the end of the half term. • The Factor Theorem • The Binomial Theorem • Trigonometric functions, equations and identities	After Christmas students will have finished statistics and begin the mechanics component of the course. Speed- and distance-time graphs, SUVAT formulae in one dimension and Newton's 2nd Law all feature. In Pure mathematics students extend their knowledge of vectors from GCSE and begin learning about calculus, a standout topic. • Vectors • Differential calculus • Tangents and normal to a polynomial curve	The February half-term is extremely important for the Y12s. In pure maths they learn about integral calculus, exponentials and logarithms – topics that will form the backbone of their studies in Y13. In mechanics students learn about systems of connected particles as well as how to apply their knowledge of calculus to particles with varying acceleration. Students finish the AS course at the end of the half-term. • Integration	After the half-term break students begin the A2 content. In Pure mathematics this means starting A2 trigonometry while in statistics they learn about correlation, regression and conditional probability. Students also sit two sets of mocks in preparation for their KAT 3 examinations. The final weeks of term are spent revising the AS content ahead of their KAT 3 exams. • Radians • Arcs and sectors	After some more revision the KAT 3 examinations take place. Papers are in the style of the AS Maths assessments. The rest of the year is spent reviewing their KAT 3 papers in class and revising the A2 content learned in the previous half-term. Students are given a summer homework and expected to self-learn: • Partial fractions • The trapezium rule • Vectors in 3 dimensions

	• Co-ordinate geometry • Sampling • Measures of central tendency and variation • Probability	• Discrete distributions • The binomial distribution • Hypothesis testing	• Modelling with calculus • V-T & S-T graphs • SUVAT formulae • Newton's 2nd Law and its applications	• Exponentials • Logarithms • Logarithmic data • Connected particles • Variable acceleration	• Additional formulae • Modelling with trigonometric functions • The PMCC • Regression lines • Hypothesis testing for correlation • Conditional probability	
Year 12 A Level Further Mathematics	Students start the year extending their knowledge of surds and quadratics into complex numbers. Thereafter students learn about matrices and linear transformations, extending their knowledge of transformations from GCSE maths. • Complex numbers • Argand diagrams • Matrices • Linear transformations	In the second half term students complete the bulk of the pure mathematics, including extensions of sequences and algebraic proof from GCSE maths and polynomials from AS maths. • Roots of polynomials • Series • Proof by induction	Students extend their knowledge of vectors and learn about volumes of revolution after the Christmas break. The latter topic allows students to derive the familiar volume formulae they will have first learned in KS3. Students then begin the further statistics component of the course, delving deeper into discrete random variables and the Poisson distribution. • Further vectors • Volumes of revolution • Discrete random variables • Expectation and variance of a random variable	This half-term sees students learning how to conduct chi-squared tests for goodness of fit – arguably the most applied piece of mathematics on the A-level syllabus. After this they start Further Mechanics, learning about momentum and impulse in one dimension. • Goodness of fit • Chi squared testing • Impulse and momentum in one dimension	After easter students finish the further mechanics component of the AS course before beginning revision for their KAT 3 examinations in the following half-term. Regular mocks start to help students cement their understanding of the AS course. • Elastic collisions • Work and power • Conservation of mechanical energy	Students sit their KAT 3 examinations after a few more weeks of revision. The rest of the term is spent reviewing their KAT 3 papers and starting the A2 further mechanics content. • Momentum and impulse in 2D • Oblique collisions between a particle and one or more walls
Year 13 A Level	Students begin the year by finishing off the trigonometry	Calculus continues to be the central topic in pure maths. Students	After Christmas students conclude their study of integral	With the bulk of the course taught students finish off	The final weeks in school are spent going through past	

	they started learning at the end of last half-term before moving on to functions and A2 differential calculus. In statistics the final topic is completed: the normal distribution and its applications – a staple of scientific and statistical analysis. Students then start studying moments as the first topic in A2 mechanics. • Modelling with trigonometric functions • Functions • Differentiating trigonometric and exponential functions • The chain rule • The normal distribution • The sample mean distribution • A2 hypothesis testing	learn about the product and quotient rules in differentiation before tackling integration. In mechanics students learn how to model friction and calculate the velocity/displacement of a particle on an inclined plane. • Differentiation • Integration using the chain rule • Integration by substitution • Resolving forces at angles • Inclined planes	calculus by learning how to form and solve first order differential equations. In mechanics students apply the SUVAT formulae they learned in AS maths in two dimensions to calculate the trajectory of a projectile. After this they explore a particle with variable acceleration in two dimensions; this corresponds nicely with the final pure topic this half-term – parametric equations. • Integration by parts • Connected rates of change • Separation of variables • Parametric equations • Projectiles • Variable acceleration in 2D.	the final bits and pieces of the pure maths syllabus in and around the KAT 2 cycle. Students extend their knowledge of sequences and series, algebraic proof and iterative numerical methods. KAT 2 covers the majority of the content and is a final benchmark for students' performance ahead of the summer exam series. • Arithmetic sequences and series • Geometric sequences and series • A2 binomial expansion • Iteration • The Newton-Raphson method • Proof by contradiction.	papers and honing exam technique. Study leave starts thereafter and students attend Warm-up revision sessions the day before each of their maths exams.	
Year 13 A Level Further Mathematics	Students finish off the A2 further mechanics they	Students continue with the pure component of the	Students spend the first half of the half-term tacking	After finishing off further statistics, students complete	Study leave starts after a few weeks of term time.	

	began to learn in the summer of the preceding year before moving on to the A2 Pure content. Students extend their knowledge of complex numbers and series from the AS course. • Oblique collisions in 2D • Hooke's Law • Elastic potential energy • Complex numbers • Method of differences	course. Now that the bulk of the calculus in the A2 maths course has been covered, students spend the majority of the next two half-terms learning various extensions of these techniques. • Hyperbolic functions • Maclaurin series • Further differentiation • Further integration • Polar co-ordinates	differential equations, the theory of which underpins our modern understanding of physics and the stock market. In the last two weeks of term students begin the A2 further statistics content. • First order differential equations • Second order differential equations • Differential equations in mathematical modelling • The geometric and negative binomial distributions • Further hypothesis testing • The central limit theorem	their KAT 2 examinations before starting revision for their final exams in the summer. • Probability generating functions • Quality of hypothesis tests	Warm-up revision sessions take place before each examination.	

Year 6 to 7 Transition

Throughout the year, there is ongoing collaboration between the Maths Lead in the primary phase and the Curriculum Leader of Maths in the secondary phase. Joint learning walks and book looks are carried out. There are opportunities for cross-phase leaders to spend time in

classrooms and teach cross-phase. The cross-phase team ensure that the transition is seamless and that the secondary teachers are provided with a range of information from the Primary classroom.

The transition program from year 6 to 7 involves focusing on the use of calculators, negative numbers and algebra, which have been identified as key skills. The Curriculum Leader of Secondary Maths works closely with the Primary Maths Lead to develop a bespoke scheme of learning to ensure that pupils have the skills and knowledge required when moving into year 7. Secondary maths routines such as classroom expectations and homework requirements are shared with the year 6 teachers so they can prepare pupils for the transition.

The Curriculum Leader of Secondary Maths and the Head of Key Stage 3 lead meet with the Primary Assessment Lead to understand the end of Key Stage 2 data and have access to data overviews via insight tracker. This provides an in-detail component by component review for each student. This allows the curriculum to be altered to the students' needs. The Year 6 teachers provide handover notes about the students to provide a more holistic outlook of the student in mathematics to personalise their learning and to promote engagement around maths.

GL assessments are conducted in the beginning of Year 7. This is an accurate baseline to ensure the best starting point for each student to inform curriculum planning and teaching and learning. Every cohort is different so the data from assessments will inform decisions on what key topics to address during the year and use this as our base for retrieval practice.

Enrichment Opportunities:

Students in the Primary Phase take part in several extra-curricular opportunities. These include NSPCC Number Day, the National Young Mathematicians' Award (UKS2), National Numeracy Day, Young Enterprise Fiver Challenge, First Mathematics Challenge (LKS2) and the Primary Mathematics Challenge.

We also offer a Chess club to our students providing them with the opportunity to learn how to play the game, and to play games against each other. We have created Maths inter form challenges and internal chess competitions. Chess can help you to think ahead, not rush your decisions, and weigh the pluses and minuses of your choices. This correlates to challenges we face in everyday life, and just as in chess, we try to make the best choices to develop positive outcomes for our lives. This club is open to all students in all year groups and is undertaken weekly at lunchtime.

The Secondary Phase run a range of enriching activities in and out of the classroom. In the classroom, students can learn about enriching mathematical topics and activities through the exploration of concepts. All students will complete various examples from non-worded to worded questions as well as non-algebraic to algebraic questions. All students in KS3 and KS4 will be stretched by having an in depth investigates concepts taught. For example, in Key Stage 3, students will learn about powers and roots and apply it the fractional and negative indices. In Key Stage 4, students will learn about indices and use that knowledge to complete the inverse function; logarithms. All

students will also go through an array of worded problems and algebraic problems to logically think through solutions using what they have explored.

There are a wide range of extra-curricular clubs which are run in the Mathematics department. All students are encouraged to attend to help promote and develop a love of mathematics and problem solving in our students. UKMT is hugely popular across all year groups in both the individual and teams' challenges, and many of our students have been awarded bronze, silver and gold certificates, some even progressing to the Kangaroo and Olympiad rounds. The whole of year 7 will undertake the challenge as well as we top bands of year 8,9, 10 and 11.

To help the students develop the love for Mathematics we have dedicated a club to the Junior Mathematics Challenge (JMC) and the Senior Mathematics Challenge (SMC) to allows students to think beyond the curriculum and ask questions about Mathematics that promotes the goldens threads; collaboration and love. This club is undertaken weekly and the highest attaining students in mathematics partake in this club.

We have embedded cross curricular links with computing and science by creating STEM lessons. The STEM lessons can help students delve into real world problem using maths and science. These links align with the virtues of the school to build the students' intellectual curiosity. These lessons happen at the end of the term and are built into the curriculum so that all year groups can undertake a STEM activity.

The mathematics department created standalone lessons to promote all the golden threads (peace, collaboration, love and forgiveness) as well as commemorating black history. Students delve into the story behind the book by Margot Lee Shetterly, Hidden Figures. The students will delve into the cold war and how mathematics was used during this time to help the United States of America compete in the space race. The students will undertake activities in understanding some of the mathematical terminology used in the movie for example prime numbers and tessellation. The students will learn about the roles of the main characters which will promote the type of careers you can achieve following mathematical pathway. The students will delve into how graphs are used in real life and how it is used in the Key Stage Three and GCSE curriculum.

The curriculum is intertwined to link with careers. The curriculum has small career related activities or teacher points that teachers can refer to in the lesson. Students will have thought provoking themes and that can be researched at home if they want to know more about those careers. The discussions and culture within the classrooms mean students independently probe into their future by seeing how these concepts practically come into a workplace.

Curriculum Impact:

Students will know more, remember more and understand more about the curriculum. Students retain prior-learning and explicitly make connections between what they have previously learned and what they are currently learning.

Students understand the relevance and importance of what they are learning in relation to real world concepts. Students know that maths is a vital life skill that they will rely on in many areas of their daily life. Students have a positive view of maths due to learning in an environment where maths is promoted as being an exciting and enjoyable subject in which they can investigate and ask questions; they know that it is reasonable to make mistakes because this can strengthen their learning through the journey to finding an answer.

Formative assessment is an integral part of our approach to Teaching and Learning. Over the course of their study, we will use weekly cumulative formative diagnostic assessments (in class or for homework) to ensure that students are consistently retrieving their knowledge of different components. The purpose of this is to ensure all knowledge is retained (and any gaps are identified and addressed promptly) and to inform teachers' planning. Using this style of assessment, we will make use of the advantages of spaced practice as well as allowing students to be able to apply their knowledge to a wide variety of contexts.

Students will also sit a summative assessment every full term. This assessment will be cumulative and will assess not only what the students have learned over the previous term, but also their understanding of all relevant material previously taught. Staff are supported to mark these accurately and post assessment moderation also takes place to ensure the validity of the data. All data is analysed centrally (not by teachers) and each Curriculum Leader is given a report outlining the areas of strength and weakness. Curriculum Leaders use this information to inform future planning, support with additional interventions and set changes.

Students are confident to 'have a go' and choose the equipment they need to help them to learn along with the strategies they think are best suited to each problem. Our students have a good understanding of their strengths and targets for development in mathematics and what they need to do to improve. Our books evidence work of a high standard of which students clearly take pride; the components of the teaching sequences demonstrate good coverage of fluency, reasoning and problem solving. Our feedback and interventions support students to strive to be the best mathematicians they can be, ensuring a high proportion of students are achieving above national average outcomes at the end of each phase.