CORE KNOWLEDGE

What I will know and understand by the end of Year 7.

By the end of this year in Mathematics, we will be able to understand, reason with and solve problems involving...		This links to:	Key Vocabulary:
1	• Sequences, exploring diagrams and lists of numbers • Understanding and using algebraic notation with function machines and substitution • Equality and equivalence, including solving one step equations, collecting like terms and identifying identities.	• Solving equations and using linear graphs in future blocks • place value from KS2 through exploration of decimals	• Linear • Constant difference • Inverse • Substitution • Equation • Equality • Equivalence
2	• Place value, ordering integers and decimals and basic standard form. • Converting between fractions, decimals and percentages • Addition and subtraction, in contexts including perimeter, tables and charts and standard form.	• FDP conversions from KS2 which included ½ , ¼ and ⅕. *Addition and subtraction are core mathematical skills throughout all key stages.*	• Integer • Range • Median • Fraction • Decimal • Percentage • Commutative • Associative • Frequency tree • Standard form
3	• Multiplication and division, including factors, multiples and in the context of mean, area and algebraic expressions • Fractions and percentages of amounts	• Factors, multiples and prime factorisation in future blocks. • Finding percentages of an amount in multiples of 5% and 10% from KS2. *Directed number is a core mathematical skill used throughout all key stages*	• Product • Quotient • Numerator • Denominator • Mean • Area • Factor • Multiple
4	• Operations and equations with negative numbers, including solving two step equations • Addition and subtraction of fractions, including basic algebraic fractions	• Addition and subtraction of fractions with common denominators and different denominators at KS2 • Different types of fractions in KS4 such as irrational numbers and algebraic.	• Positive • Negative • Solve • Power • Unit fraction • Numerator • Denominator
5	• Constructing, measuring and using geometric notation • Geometric reasoning, using angle facts to find missing angles in lines and polygons	• Using rulers, protractors and other measuring equipment at KS2. • Geometric proof at KS4	• Acute • Obtuse • Reflex • Parallel • Perpendicular • Vertex • Construct • Polygon
6	• Number sense, including prime factors and estimation • Sets and probability from Venn diagrams, sample space diagrams and the probability scale • Prime numbers and proof, including finding the lowest common multiple and the highest common factor	• FDP equivalence from earlier in year 7. • Using Venn diagrams to find probability in year 8	• Estimate • Element • Member • Intersect • Multiple • Factor • Prime

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 8.

By the end of this year in Mathematics, we will be able to understand, reason with and solve problems involving...		This links to:	Key Vocabulary:	
1	• Ratio and scale, including ratio notation, dividing in a given ratio and using pi as a ratio • Multiplicative change, including direct proportion and scale factors • Multiplying and dividing fractions • Working in the cartesian plane with linear graphs including in the form y=mx+c	• KS2 use of scale factors • Calculating with algebraic fractions in KS4 • Finding the equation of a straight line in KS4	• Ratio • Simplify • Scale factor • Numerator • Denominator	• Reciprocal • Gradient • Parallel
2	• Representing data in scatter graphs, frequency tables and two way tables. • Tables and probability, including sample space, Venn diagrams and two way tables. • Brackets, equations and inequality	• Reading data from tables in KS2 • Introduction to Venn diagrams in year 7 • Solving quadratic equations in KS4	• Correlation • Frequency • Outcomes • Sample space	• Expand • Factorise • Expression
3	• Sequences, including finding and using the nth term • Indices and applying the index laws • Fractions and percentages, including converting between the two and percentage change.	• Describing sequences and patterns in year 7 block 1 • Calculating with standard form in KS4 • FDP equivalence in block 2 in year 7	• Indices • Power • Increase • Decrease • Multiplier	• Nth term • Generate
4	• Standard index form, including converting small and large numbers, and calculating with standard form • Number sense, including rounding, estimating, order of operation and converting units	• Place value in block 4, year 7, along with indices earlier in year 8 • Calculating error intervals and bounds in KS4	• Standard index form • Round • Estimation	• Metric • Error interval • Order of operations
5	• Angles in parallel lines and polygons • Area of trapezia and circles • Line symmetry and reflection	• Angles rules discovered in year 7 • Geometric proof in KS4 • Surface area of cylinders in KS4 • Properties of 2D shapes in KS2	• Quadrilateral • Polygon • Interior • Exterior,	• Trapezium • Compound shape • Symmetry
6	• The data handling cycle, including data collection, representation and interpretation. • Measures of location, involving the mean, median, mode and range	• Comparing distributions of box plots, cumulative frequency graphs and histograms in KS4	• Primary data • Secondary data • Mean • Median	• Mode • Grouped data • Modal class

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 9.

By the end of this year in Mathematics, we will be able to understand, reason with and solve problems involving...		This links to:	Key Vocabulary:
1	• Straight line graphs including y=mx+c and the application of this to proportion. • Forming and solving equations and inequalities, with rearranging formulae • Testing conjectures involving algebra manipulation • Three dimensional shapes including properties, volume and surface area	• Sequences, block 1 in year 7 • Solving equations graphically at the end of year 9 and in KS4 • Knowledge of types of number in KS2 and year 7	• Gradient • Intercept • Formulae • Identity • Inequality • Proof • Face • Edge • Vertex
2	• Constructions and congruency • Numbers, including rational and irrational numbers, specifically surds.	• Knowledge of scale factors from year 8 block 1 • Calculating with fractions from year 7	• Construct • Perpendicular, • Bisector • Congruent • Rational • Irrational • Surd
3	• Using percentages, involving multipliers. • Maths and money, including interest, tax and exchange rates	• Percentage increase and decrease with multipliers from year 8 block 10 • Understanding exponential growth in KS4	• Increase • Decrease • Multiplier • Interest • Compound • Tax • Exchange rate
4	• Deduction, using known angle facts and properties of shape • Rotation and translation	• Geometric proof, including circle theorems in KS4 • Vectors covered in year 10 • Finding the length of lines in the Cartesian plane in KS4 and beyond	• Rotational symmetry • Translate • Variance • Invariance • Deduce • Alternate • Corresponding • Quadrilateral
5	• Pythagoras' theorem and its application, looking to trigonometry in right angled triangles. • Enlargement and similarity, involving positive, fractional and negative scale factors	• Using negative scale factors in KS4 • Forming equations using inverse proportion in KS4 and beyond	• Hypotenuse • Pythagoras • Adjacent • Enlargement • Scale factor • Similar
6	• Solving ratio and proportion problems, including both direct and inverse proportion • Rates, including speed, density and other rates of change • Solving problems using graphs, tables and algebra	• Interpreting area under a curve covered in KS4 and KS5 • Algebraic manipulation from year 7 and 8 • Interpreting tables and graphs, content from KS2 and year 7 and 8	• Direct proportion • Inverse proportion • Density • Speed • Compound units, • Quadratic • Reciprocal

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 10.

By the end of this year in Mathematics, we will be able to understand, reason with and solve problems involving...		This links to:	Key Vocabulary:
1	• Conditions for congruence and similarity and linking to enlargement • Trigonometry including missing angles and sides in right angled triangles • Representing solutions of equations and inequalities	• Enlargement from Year 9 HT 5 • Using the sine and cosine graphs in Year 11 and KS5 • Block 7 in year 8, brackets equations and inequality	• Congruent • Similar • Hypotenuse • Inequality • Equation • Adjacent • Sine • Cosine • Tangent
2	• Simultaneous equations, including forming and solving simultaneous equations in different contexts • Angles and bearings	• Solving quadratic simultaneous equations in year 11 and KS5 • Angle rules from KS3 • Forces in mechanics KS5	• Simultaneous • Coefficient • Elimination • Graphically • Algebraically • Bearing • Alternate • Corresponding
3	• Working with circles, including finding the area of sectors and arc lengths • Vectors, including vector notation and vector translation	• Circle theorems in year 11 • Carrying out translations in year 9 • Proving two vectors are parallel and on a straight line in Year 11 and KS5	• Circumference • Diameter • Radius • Sector • Arc • Scalar • Column vector • Translation
4	• Ratio and fractions, including ratio in the form 1:n, and linking ratio to area and volume • Percentages and interest, including compound interest and growth and decay context. • Probability, including independent events and conditional events	• Ratio and scale in block 1 in year 8 • Fractions, decimals and percentage equivalence in year 7, along with use of multipliers in year 9 • Fraction multiplication from KS3	• Simple interest • Compound interest • Exponential • Growth and decay • Mutually exclusive • Independent • Conditional
5	• Collecting, representing and interpreting data, including graphs of discrete and continuous data, and averages. • Non-calculator methods, including estimation, error intervals and bounds, and surds	• Statistical analysis, including correlation coefficients in KS5 statistics • Calculating with exact values from Number sense in year 8	• Sampling • Frequency • Grouped data • Cumulative frequency • Histogram • Estimate • Error interval • Bounds • Surds
6	• Types of number and sequences, including linear nth term and quadratic nth term • Indices and roots, including all index laws and standard form • Manipulating expressions, including algebraic fractions	• Finding the quadratic nth term in year 11 • Knowledge of standard index form from year 8 • Surd manipulation in year 11 and KS5	• Prime factorisation • Arithmetic • Geometric • Root • Index form • Factorise • Quadratic

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 11 (F).

By the end of this year in Mathematics, we will be able to understand, reason with and solve problems involving...		This links to:	Key Vocabulary:
1	• Expanding and factorising, including quadratics • Changing the subject including formula and to solve equations • Function machines to find inputs and outputs	• Solving equations year 11 and KS5 • Algebraic reasoning Year 11 and KS5 • Block 7 in year 8, brackets equations and inequality • Simultaneous equations year 10	• Expand • Factorise • Equation • Identity • Inequality • Quadratic • Formula • Input • Output
2	• Linear graphs, including interpretation of y=mx+c • Non linear graphs, including plotting and interpreting quadratic graphs and recognising other graphs • Application and interpretation of graphs, including distance time graphs and conversion graphs	• Solving problems with graphs, tables and algebra in year 9 • Working in the cartesian plane from KS3 • Coordinate geometry in KS5	• Gradient • Y-intercept • Linear • Quadratic • Reciprocal • Plot • Conversion
3	• Multiplicative reasoning involving direct and inverse proportion • Geometric reasoning, involving knowledge of shape and angles • Algebraic reasoning, including sequences and proof	• Ratio and proportion from year 10 • Trigonometry from year 10 • Proof in KS5	• Density • Pythagoras • Hypotenuse • Nth term • Direct proportion • Inverse proportion • Proof
4	• Transformations and constructions • Listing and describing outcomes including probability • 'Show that…'	• Constructions from year 9 • Enlargements from year 10 • Statistics in KS5	• Rotate • Reflect • Translate • Vector • Perpendicular • Bisector • Construct • Locus • Outcome • Probability
5	**Examination preparation**		
6			

Target Grade:		AP1:		AP2:		AP3:	

CORE KNOWLEDGE

What I will know and understand by the end of Year 11 (H).

By the end of this year in Mathematics, we will be able to understand, reason with and solve problems involving...		This links to:	Key Vocabulary:	
1	• Expanding and factorising, including solving quadratics and quadratic inequalities • Changing the subject involving formula and to solve equations with iteration • Function machines to find inverse functions and composite functions	• Solving equations year 11 and KS5 • Algebraic reasoning Year 11 and KS5 • Block 7 in year 8, brackets equations and inequality • Simultaneous equations year 10	• Quadratic • Difference of two squares • Inequality • Inverse	• Turning point • Coefficient • Iteration • Composite • Complete the square
2	• Linear graphs, including the use of y=mx+c to find the equation of perpendicular lines • Non linear graphs, including reciprocal, exponential, sine, cosine, tangent and circle graphs • Application and interpretation of graphs including tangent to a curve and the area under a graph	• Solving problems with graphs, tables and algebra in year 9 • Working in the cartesian plane from KS3 • Coordinate geometry in KS5	• Perpendicular gradient • Reciprocal • Minimum point • Quadratic	• Exponential • Cubic • Tangent
3	• Multiplicative reasoning involving direct and inverse proportion • Geometric reasoning, involving knowledge of shape and angles, including sine and cosine rule • Algebraic reasoning, including quadratic sequences and algebraic proof	• Ratio and proportion from year 10 • Trigonometry from year 10 • Proof in KS5	• Density • Hypotenuse • Exact • Proof • Nth term	• Direct proportion • Inverse proportion
4	• Transformations and constructions • Listing and describing outcomes including conditional probability • 'Show that…'	• Constructions from year 9 • Enlargements from year 10 • Statistics in KS5	• Enlarge • Vector • Perpendicular bisector • Angle bisector	• Conditional probability • Locus
5	**Examination preparation**			
6				

Target Grade:		AP1:		AP2:		AP3:	