Maths Curriculum Overview

Due to the nature of Mathematics and the building blocks that are required to progress, the Scheme of Work has been developed to be fluid and allow different start positions. The route your child will take is dependent on the success of their cohort in KS2 and the progress that they are making as an individual. This differentiated route will be assessed at regular intervals and any change to your child's path will be notified via the student journal under the weekly comment section.

Due to the exceptional circumstances of the previous academic year this year all classes and pupils will follow a bespoke catch up plan for Term 1. This has been planned in conjunction with your child's previous and new maths teacher to ensure that all pupils are caught up and ready to continue with the next stage of the scheme of work.

All pupils in Year 7 will complete a programme of key numeracy skills from Year 6 planned in conjunction with primary specialists. This will include long addition, subtraction, multiplication and division, percentages, fractions, decimals and negative numbers.

Starting positions 2020 – 2021 – From Term 2

Set / Year	1	2	3	4	5	6	7	8
7	Level 6 Cycle 1	Level 5 Cycle 3	Level 5 Cycle 2	Level 5 Cycle 1	Level 4 Cycle 3	Level 4 Cycle 2	Level 4 Cycle 1	Level 3-4 Bridging Unit
8	Level 6 Cycle 4	Level 6 Cycle 2	Level 6 Cycle 1	Level 5 Cycle 4	Level 5 Cycle 3	Level 5 Cycle 2	Level 5 Cycle 1	Level 4 Cycle 2
9	Delta (D)	Gamma (C)	Level 6 Cycle 4	Level 6 Cycle 3	Level 6 Cycle 1	Level 6 Cycle 1	Level 6 Cycle 1	Level 5 Cycle 3
10	Iota (I)	Epsilon (E)	Delta (D)	Gamma (C)	Level 6 Cycle 4	Level 6 Cycle 4	Level 6 Cycle 3	Level 6 Cycle 2
11	Exam Practice (H)	Exam Practice (H)	Exam Practice (H)	Exam Practice (H)	Exam Practice (F)	Exam Practice (F)	Exam Practice (F)	Exam Practice (F)

Scheme of Work

At the end of each cycle of work pupils will revise. They will then do a test consisting of topics recently studied and a linked functional skills question. They will then go through the test with the classroom teacher and receive feedback on topics completed well and topics which require improvement. When studying Levels 4-6 pupils will also do a mental arithmetic test at the end of each cycle.

Levels

	Level 4	Level 5	Level 6
Cycle 1	Estimating and measuring Drawing Perimeter Area Reflection Rotation Basic averages Place value	Fractions Function machines Terminology Angles Questionnaires and data	Multiplication of decimals Division of decimals Sequences Bearings Correlation
Cycle 2	Shape vocabulary Constructions Angles Fractions Multiplication and division Terminology	Index laws Negative numbers Expressions Multiplication and division Reflection Nets Averages	Linear equations Fractions Enlargement Reflection Interior and exterior angles Averages
Cycle 3	Basic probability Frequency diagrams Addition Subtraction	Ratio Rounding Co-ordinates Linear graphs	y=mx+c Fractions 3D representations Geometry and proofs

	Formula Coordinates	Area Constructing triangles Probability	Questionnaires Continuous data
Cycle 4	N/A	Linear equations Fractions Place value Decimals Conversions Metric Units Angles Pie Charts Conversion Graphs	Ratio Area Volume Constructions Nets Surface area Probability

GCSE

Alpha (A)	Zeta (F)	Lambda (K)	Pi (P)
Standard form Surds Simultaneous Equations Similar shapes Venn diagrams	Compound measures Proportion Volume Surface Area	Functions Tangents Proportion Iteration	Estimating Inequalities Trigonometry Real life graphs

Beta (B)	Eta (G)	Mu (L)	Statistics Cycle 1 10MA1 and 11MA1
Coordinates Transformations Place value Rounding Estimation Fractions and decimals Drawing and interpreting graphs Questionnaires Sequences	Drawing linear and quadratic graphs Simultaneous equations Probability Standard Form	Transformations Types of number Histograms Frequency Polygons Simultaneous Equations including quadratics	Data types Sampling Presenting data Line graphs Pie charts Averages Control charts Measures of spread Standard deviation
Gamma (C)	Theta (H)	Nu (M)	Statistics Cycle 2
Negative numbers Solving equations Ratio Proportion Linear graphs Fractions, decimals and percentages Percentage multipliers	Area Nets Surface Area Sequences including quadratics Cumulative frequency Box and Whisker Plots Angles on parallel lines Bearings Circle Theorems	Pythagoras Trigonometry Ratio Proportion Probability diagrams Solving quadratics	Presenting data Population pyramids Conditional probability Drawing histograms The shape of a distribution Box and whisker diagrams The normal curve
Delta (D)	Iota (I)	Xi (N)	Statistics Cycle 3
Probability Enlargements Maps and scale drawing Laws of indices BIDMAS Real life graphs	Quadratics – factorising, solving and sketching Bounds Percentages including compound interest and depreciation Volume Density Probability Tree Diagrams	Vectors Circle Theorems Trigonometry Bearings Pythagoras Indices Standard form	Errors in measurement Misleading graphs Time series graphs and trends Moving averages Weighing Index numbers Birth and death rates
Epsilon (E)	Kappa (J)	Omicron (O)	Statistics Cycle 4
Trigonometry Expanding brackets Factorising Averages from grouped data Moving averages Circumference Perimeter Dimensions Metric and imperial measures Pythagoras' theorem	Transformations Similar Shapes Constructions Loci Solving quadratics Using Graphs Trial and improvement Trigonometry Inequalities	Graphs Conditional probability Sampling Sectors Volume Similarity	Finding probabilities Probability trees Scatter graphs The equation of the line of best fit Spearman's coefficient of rank correlation Product moment correlation coefficient

<u>Exam Practice Skills by Grade</u>

Grade 9/8	**Grade 7**	**Grade 6/5**	**Grade 5/4**
Calculating bounds in area and volume questions Manipulating complex indices, including surds Solving simultaneous equations – one linear and one quadratic Using equation of a circle and finding points of	Rationalising surds Calculating upper and lower bounds Manipulating fractional indices Rearranging formulae where the variable occurs twice Manipulating simple algebraic fractions	Calculating compound interest Calculating reverse percentage problems Calculating with fractions and mixed numbers Calculating problems involving numbers in standard form Understanding negative	Estimation and division by a number less than 1 Compound interest Using a calculator in complex situations Multiplication and division by a number between 0 and 1 Calculating with fractions Calculating with ratios

intersection with a line Transforming graphs of trigonometrical functions Knowing graphs of exponential and more complex functions Manipulating algebraic fractions Rearranging complex equations Transforming graphical functions, e.g. y = f(x+a); y = f(ax) Solving 3D trigonometry problems Using the sine and cosine rule Mensuration in 3D solids and 2D shapes Knowing proofs of circle theorems Knowing proofs of construction theorems	Solving algebraic problems, e.g. explain why (n+1)(n+20) is an even number Solving quadratics by factorising, formula or completing the square Solving equations graphically Recognising the difference of two squares Simplifying algebra involving powers Calculating equation of line through a point and perpendicular to a given line Finding trigonometrical solutions, e.g. cosx = 0·5 Recognising graphs of trigonometrical functions Using the sine and cosine rule in simple cases Calculating surface area or volume of various solids Solving problems involving arcs, sectors and segments Using Pythagoras' Theorem in 3D situations Using similarity in length, area and volume Calculating the distance between points using 3D co-ordinates Proving that triangles are congruent Using circle theorems Carrying out an enlargement with a negative fractional scale factor Using the fact that the area of triangle = ½absinC Constructing and interpreting histograms Understand stratified sampling Find probability for combined events using multiplication and addition	indices Recognising the difference of 2 squares Solving inequalities by algebraic or graphical methods Solving simultaneous equations by graphical or algebraic methods Matching equations to their graphs Solving simple quadratics by factorising Solving equations involving fractions Expanding brackets Using y=mx+c to find the gradient and equation of a line without drawing Solving cubic equations graphically (when the graph is given) Solving quadratic equations graphically Recognising graphs of cubic and reciprocal functions Simplifying fractions where the denominator is an algebraic expression Factorising expressions, e.g. $6(a-b)^2 - 3(a-b)$ Using circle theorems Understanding similar shapes Solving multi-stage trigonometrical problems Describing transformations Finding interior and exterior angles of polygons Finding dimensions of a formulae Using tree diagrams for probability Analysing data to compare with theoretical results Drawing box plots from a cumulative frequency table Finding median and inter-quartile range from cumulative frequency table or graph	Calculating percentage decrease and increase Multiplication and division by powers of 10 and decimals Using prime factor decomposition Using the rules of indices Solving cubic equations by trial and improvement Rearranging simple formulae Solving equations Solving inequalities Expanding brackets Graphing quadratic functions in simple cases Interpreting real-life graphs, e.g. travel graphs Finding linear n^{th} terms Finding the length of a line given 2 points Substitution into complex formulae Constructing the perpendicular bisector of a given line Constructing loci Finding volumes of 3D shapes including prisms Calculating area or circumference of a circle from diameter Carry out transformations including translation with vectors Use of Pythagoras' Theorem and trigonometry Carrying out constructions, e.g. triangles in all situations Solving problems involving polygons, e.g. interior angles Understanding, using and solving problems with bearings Drawing box plots Calculating moving averages Finding mean and median from grouped data Designing questionnaires Explaining the use of different averages
Grade 3	**Grade 3/2**	**Grade 2/1**	**Grade 1**
Estimation Calculating profit and loss Solving simple proportion problems Calculating percentage increase and decrease Calculating with fractions Calculating with ratios in recipes Expanding brackets Factorising, e.g. $x^2 - 5x$ Understanding linear graphs Deriving and solving equations from diagrams	Simplifying ratios Using a calculator Rounding to 1 significant figure Calculating simple fraction questions Long multiplication and division, including decimals Finding percentages by mental methods Ordering fractions, decimals and percentages Calculating indices and	Carrying out long multiplication and division: 3-digit by 2-digit Calculating simple percentages of quantities Calculating simple fractions of quantities Understanding the order of operations Rounding to various decimal places Understanding place value Finding simple squares, cubes and roots	Rounding to the nearest integer Interpreting bills and timetables Rounding to the nearest 10,100, 1000 Identifying fractions from a shaded diagram Identifying percentages from a shaded diagram Calculating simple fractions of quantities (numerator of 1) Ordering decimals Ordering, reading and

Substituting negative numbers into expressions Expanding and simplifying brackets and expressions Solving equations, including unknowns on both sides Converting between units of area, e.g. m^2 to cm^2 Calculating area or circumference of a circle Finding area of triangle, regular polygons, compound shapes Drawing and measuring bearings Finding midpoint of a line given the end co-ordinates Carrying out simple transformations Solving simple problems involving polygons Solving problems involving similar triangles (+ve scale factor) Constructing and interpreting plans and elevations Solving problems involving parallel lines Knowing triangle proofs (exterior angle & angle-sum) Constructing a stem and leaf diagram Understanding and using relative frequency Finding missing probability from a list or table of results Constructing and interpreting scatter graphs Drawing and using lines of best fit Understanding correlation Finding the modal class from grouped frequencies Finding the mean Explaining deficiencies in questionnaires and sampling techniques	roots, e.g. '4^3', '$2^3 \times 3^2$', 'the cube of 4' Using the four rules with negative numbers Calculating VAT Constructing simple linear graphs Simplifying simple algebra Using a formula inversely, e.g. find x if y=3 where y = 2x-1 Using conversion graphs Recognising complex number sequences Solving simple equations, e.g. 3y + 2 = 8 Understanding the geometry of triangles and quadrilaterals Measuring simple bearings Carrying out enlargements in simple cases Converting between metric and imperial units using known facts Calculating volumes in simple cases Completing tessellations Finding area and perimeter of rectangles and kites Identifying planes of symmetry Working with nets of shapes Constructing accurate drawings and angles Carrying out simple transformations Interpreting a stem and leaf diagram to find the median Interpreting a time series graph Using data collection sheets Using a 2-way table Using the fact that the sum of probabilities is 1 Using 'fx' in a frequency table Constructing a pie chart	Finding factors of numbers Converting between fractions, decimals and percentages Using negative numbers in context Finding terms in a linear sequence Recognising non-linear number sequences Using co-ordinates in four quadrants Using simple formulae Solving simple equations, e.g. 5x = 25 and x-2=6 Deriving simple expressions Estimating lengths Using simple scale drawings Naming, measuring and drawing angles Naming polygons Identifying lines of symmetry Identifying rotational symmetry Using the angle sum on a straight line = 180º Identifying faces, edges and vertices Stating simple probability Listing all outcomes for a single event Estimating probability from diagrams, pie charts and tables Finding range, and using to compare two distributions Finding mean and mode Interpreting pie charts Using bar charts to compare two sets of data	writing whole numbers Converting fractions to a ratio, e.g. 1/3 of a whole is 1:2 Using co-ordinates in one quadrant Reading from simple real-life graphs Finding the next term in a simple linear sequence Finding areas, perimeters and volumes by counting Drawing 2D shapes Measuring and drawing lines Drawing circles Naming shapes Drawing lines of symmetry on a diagram Using a given line of reflection Completing accurate drawings of given shapes Finding median and mode using single digits Drawing and interpreting line graphs, bar charts and pictograms Making tables, lists and tally charts from discrete data Being able to choose the 'most likely' outcome from given information