Year 7

**Autumn 1 ~ place value, addition and subtraction**

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| Unit 1 - place value (1) | * Read and write whole numbers in figures and words * Multiply, and divide, any whole number by 10, 100, 1000, or 10 000 * Round whole numbers to the nearest 1000, 100 or 10 |
| Unit 2 & 3 – Addition and subtraction (2) | * Use mental strategies * Add and subtract using formal algorithms * Calculate and work with **perimeters** * Model solve word problems |
| Unit 4 – Addition and subtraction of decimals (2) | * Understand decimal notation and place values * Read and write decimals in figures and words * Convert between decimals and fractions where the denominator is a factor of 10 or 100 * Use the number line to display decimals and round decimals to the nearest whole number, to 1 or 2 decimal places * Use correctly the symbols <, > etc. and the associated language to order a set of decimals * Multiply and divide decimals by 10, 100, 1000, or 10 000 * Solve word problems involving the addition and subtraction of money in decimal notation * Use written methods in column format for addition and subtraction of decimals * Extend existing mental calculation to include decimals * Calculate the **perimeter** of rectangles, squares and rectilinear figures |

**Autumn 2 ~ Multiplication and division**

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| Unit 5, 6, 7 & 8 multiplication and division (5) | * Use multiplication facts to solve mental calculations * Use the terms ‘product’, ‘multiple’ and ‘LCM’ * Understand and use the column method to multiply integers and decimals * Divide whole numbers and decimals by whole numbers * Use the terms ‘quotient’, ‘remainder’, ‘factor’, ‘HCF’ * Represent multiplication word problems using bar models * Find the **area** of a rectangle and triangle * Solve problems involving length, perimeter and area * Estimate answers in calculations and check that results are reasonable * Measure **time**, calculate with time and solve time word problems * Find the **mean average**, interpreting average as “total amount ÷ number of items" and solve word problems involving average |

**Spring 1 ~ 2D shapes**

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| Unit 9 – Working with units (1) | * Record and order measurements using decimal notation * Estimate and/or measure: * length in kilometres (km) /metres (m)/ centimetres (cm)/ millimetres (mm) * mass in kilograms (kg) /grams (g) * volume of liquid in litres (l) / millilitres (ml) |
| Unit 10 – Angles (1) | * Draw and measure acute and obtuse angles reliably to the nearest degree * Estimate the size of any given angle * Recognise acute, right, obtuse and reflex angles * Know and use the fact that the angles round a point total 360o, that angles on a straight line total 180o, and that vertically opposite angles are equal |
| Unit 11 & 12 – Triangles and quadrilaterals (2) | * Classify triangles and quadrilaterals according to their properties * Use a ruler and protractor to construct triangles and quadrilaterals from given data * Know and use the fact that the sum of interior angles of a triangle is 180o * know and use the fact that the interior angles of a quadrilateral sum to 360o * Solve problems involving coordinates in the first quadrant |
| Unit 13  Symmetry and tessellation (1) | * Identify lines of symmetry in any shape * Identify the order of rotational symmetry in any shape * Create shapes given details of their symmetries * Investigation and create tessellations |

**Spring 2 ~ Fractions**

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| Unit 14 – Understand and use fraction (2) | * Represent fractions using area diagrams, bar models and number lines * Recognise and name equivalent fractions * Convert fractions to decimals * Convert terminating decimals to fractions in their simplest form * Convert between mixed numbers and improper fractions * Compare and order numbers * Convert simple fractions and decimals to percentages * Express one quantity as a fraction of another |
| Unit 15 – Fractions of amounts (1) | * Find a fraction of a set of objects or quantity * Find the whole given a fraction |
| Unit 16 – Multiplying and dividing decimals (2) | * Multiply a whole number or fraction by a whole number or fraction * Multiply a mixed number and a whole number * Divide a whole number or proper fraction by a whole number or proper fraction |

**Summer 1 ~ Algebra**

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| Unit 17 – Order of operations (2) | * Carry out combined operations involving all four operations * Understand and use brackets * Use simple index notation |
| Unit 18 – Introduction to algebra (2) | * Recognise and continue sequences * Represent an unknown number using a letter * Write and understand simple algebraic expressions * Substitute numerical values into formulae and expressions * Collect like terms and simplify expressions * Multiply out brackets, identify and take out common factors to factorise * Recognise that different-looking expressions may be identical and prove simple algebraic identities |

Unit 19 – Algebraic generalisation project

**Summer 2 ~ Percentages and handling data**

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| Unit 20 – Percentages (2) | * Understand percentage as a fractional operator with denominator of 100 * Express a part of a whole as a percentage * Convert between fractions, decimals and percentages * Find fractions and percentages of given quantities * Find the whole given a part and the percentage * Increasing and decreasing by a percentage |
| Unit 21 – Handling data (2) | * Understand the difference between types of data * Construct and interpret   + Tables (including tally and two way)   + Bar charts (including comparative and composite)   + Pictograms   + Line graphs * Read and interpret pie charts * Draw pie charts from raw data * Explore misleading graphical representations |

Year 8

**Autumn 1 ~ Working with number**

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| Unit 1 – Primes and factorising (2 weeks) | * *Find the factors and multiples of a number* * Find the prime factors of a number * Determine HCF and LCM by prime factorisation * Find squares, square roots, cubes and cube roots using prime factorisation * Use indices to record repeated multiplication | Y7 U5, U16 |
| Unit 2– Add and subtract fraction (3) | * *Use equivalent fractions* * Add and subtract fractions with like and unlike denominators * Add and subtract fractions mixed numbers and improper fractions * *Convert between improper fractions and mixed numbers* * Add and subtract fractions mixed numbers and improper fractions | Y7 U13, U14, U15 |

**Autumn 2 ~ number and algebra**

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| Unit 3– Positive and negative numbers (2) | * Represent and order positive and negative integers on a number line (using the symbols >, ≥, <, and ≤) * Show addition and subtraction on a number line * Apply the four basic operations on positive and negative integers * Calculate with rational and decimal numbers (including negative numbers) | Y7 U16 |
| Unit 4 – Sequences, expressions and equations (3) | * Recognise and represent number patterns (including finding an algebraic expression for the th term) * Distinguish between terms and coefficients in algebraic expressions * Distinguish between like and unlike terms in algebraic expressions * *Simplify expressions, collect like terms and expand and factorise linear expressions* * *Substitute numerical values into formulae and expressions* * Solve linear equations in one unknown * Solve simple fractional equations that can be reduced to linear equations * Formulate a linear equation in one unknown to solve problems | Y7 U16, U17  Y8 U3 |

**Spring 1 ~ 2D geometry**

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| Unit 5 – Triangles, quadrilaterals and angles in parallel lines (3) | * *Construct a triangle from given information (sides/angles)* * *Classify special quadrilaterals on the basis of their properties: define a parallelogram, rhombus and trapezium* * *Construct a quadrilaterals from given information (sides/angles)* * Identify the different types of angles formed by parallel lines and a transversal such as corresponding angles, alternate angles and interior angles * Use the various properties of angles to find unknown angles * Find unknown angles in geometrical figures involving square, rectangle, parallelogram, rhombus, trapezium and triangle | Y7 U9, U10, U11 |
| Unit 6 – Length and area: parallelograms and trapezia (2) | * Convert between cm2 and m2 * *Find the area and perimeter of a figure made up of some of the following shapes: square, rectangle, triangle* * Find the areas of parallelograms and trapezia * Find the areas and perimeters of composite plane figures * Solve word problems involving area and perimeter | Y7 U4, U7, U8, U10, U11 |

**Spring 2 ~ Proportional reasoning**

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| Unit 7 – Percentage change (2) | * *Use percentages greater than 100%* * *Express one quantity as a percentage of another* * Compare two quantities by percentage * *Increase or decrease a quantity by a given percentage* * Understand how to compare quantities using percentages * Reverse percentages: find the original quantity given a part of it and its percentage * Reverse percentages: find the original quantity when we know its final value after the percentage increase or decrease * Solve problems involving percentages and reverse percentages | Y7 U19 |
| Unit 8 – Ratio and rate (3) | * Interpret and , where , and are whole numbers * Compare two or more quantities by ratio * Understand the relationship between ratios and fractions * Write equivalent ratios, and find the missing term in a pair of equivalent ratios * Express ratios involving rational numbers in their simplest form * Divide a quantity in a given ratio * Find the whole/ one part when a whole is divided into parts in a given ratio * Solve word problems involving ratio * Use the relationship between distance, time and speed * Write speed in different units such as km/h, m/min, m/s and cm/s * Convert from one unit of speed to another (e.g. km/h to m/s) * Solve word problems involving speed, uniform speed and average speed | Y7 U13, U14, U15 |

**Summer 1 ~ 2D and 3D geometry**

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| Unit 9 – Rounding (1) | * *Round off a number to a required number of decimal places* * Round off a number to a required number of significant figures * Estimate the answer to a given problem * Identify rounding and truncation errors | Y7 U1, U4 |
| Unit 10 – Circumference and area of a circle (2) | * Use formulae to calculate the area and circumference of a circle * Find the area and perimeter of   + semicircle (half circle)   + quarter circle * Solve word problems involving area and perimeter |  |
| Unit 11 – 3D shapes and nets (1) | * Recognise nets of 3D shapes * Build and name 3D shapes * Draw plans and elevations of a given solid * Identify a solid from its plans and elevations |  |
| Unit 12 – Surface area and volume (2) | * Find the volumes of cubes and cuboids * Find the volumes of prisms and cylinders * Find the volumes of composite solids * Explore the surface area of cubes, cuboids, cylinders other prisms and composite solids * Convert between cm3 and m3 | Y7 U6, U8  Y8 U6 |

**Summer 2 ~ handling data**

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| Unit 13 –statistics (2) | * Find the *mean,* median more and range from raw datasets * Use the mean/median/mode to compare data sets * Use an average plus the range to compare datasets * Find the mode, median and mean from tables and graphical representations (not grouped) * Explore methods of data collection including surveys, questionnaires and the use of secondary data * *Appreciate the difference between discrete and continuous data* * Classify and tabulate data * Conduct statistical investigations using collected data * *Draw, analyse and interpret graphs including those met in year 7* | Y7 U20 |

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| **Autumn 1** | Year 9 |
| Unit 1 | Calculations, checking and rounding |
| Indices, roots, reciprocals and hierarchy of operations |
| Factors, multiples and primes |
| Standard form and surds |
| **Autumn2** |  |
| Unit 2 | Algebra: the basics |
| Setting up, rearranging and solving equations |
| Sequences |
| **Spring 1** |  |
| Unit 3 | Averages and range |
| Representing and interpreting data |
| Scatter graphs |
| **Spring 2** |  |
| Unit 4 | Fractions |
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| Percentages |
| Ratio and proportion |
| **Summer 1** |  |
| Unit 5 | Polygons, angles and parallel lines |
| Pythagoras’ Theorem and trigonometry |
| Unit 6 | Graphs: the basics and real-life graphs |
| **Summer 2** |  |
| Unit 6 | Linear graphs and coordinate geometry |
| Quadratic, cubic and other graphs |
| Unit 7 | Perimeter, area and circles |

Year 10

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| **Autumn 1** |  |
| Integers and place value | Unit 1 |
| Decimals | Unit 1 |
| Indices, Powers and Roots | Unit 1 |
| Factors, multiples and primes | Unit 1 |
| Algebra: the basics | Unit 2 |
| Expressions and substitution into formulae | Unit 2 |
| **Autumn 2** |  |
| Tables, charts and graphs | Unit 3 |
| Pie charts | Unit 3 |
| Scatter Graphs | Unit 3 |
| Fractions, decimals and percentages | Unit 4 |
| **Spring 1** |  |
| Percentages | Unit 4 |
| Equations and inequalities | Unit 5 |
| Sequences | Unit 5 |
| Properties of shapes, parallel lines and angle facts | Unit 6 |
| **Spring 2** |  |
| Properties of shapes, parallel lines and angle facts | Unit 6 |
| Interior and exterior angles of polygons | Unit 6 |
| Statistics, sampling and the averages | Unit 7 |
| Ratio | Unit 11 |
| **Summer 1** |  |
| Proportion | Unit 11 |
| Perimeter, area and volume | Unit 8 |
| Real-life graphs | Unit 9 |
| Straight-line graphs | Unit 9 |
| **Summer 2** |  |
| Transformations | Unit 10 |
| Right-angled triangles: Pythagoras and trigonometry | Unit 12 |
| Probability | Unit 13 |

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| **Year 11**  **Autumn 1** |  |
| Multiplicative reasoning | Unit 14 |
| Plans and elevations | Unit 15 |
| Constructions, loci and bearings |
| Quadratic equations: expanding and factorising | Unit 16 |
| Quadratic equations: graphs |
| **Autumn 2** |  |
| Circles, cylinders, cones and spheres | Unit 17 |
| Fractions and reciprocals | Unit 18 |
| Indices and standard form |
| Similarity and congruence in 2D | Unit 18 |
| **Spring 1** |  |
| Vectors | Unit 19 |
| Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations | Unit 20 |

**Examination preparation and revision of key topics will continue until the start of GCSEs.**

**Sixth Form**

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| **Core 1** |
| Algebra and functions |
| Quadratic functions |
| Equations and inequalities |
| Sketching curves |
| Coordinate geometry in the (x,y) plane |
| Sequences and series |
| Differentiation |
| Integration |
| **Core 2** |
| The sine and cosine rule |
| Exponentials and logarithms |
| Coordinate geometry in the (x, y) plane |
| The binomial expansion |
| Radian measure and its application |
| Geometric sequences and series |
| Graphs of trigonometric functions |
| Differentiation |
| Trigonometrical identities and simple equations |
| Integration |
| **Core 3** |
| Algebraic fractions |
| Functions |
| The exponential and log functions |
| Numerical methods |
| Transforming graphs of functions |
| Trigonometry |
| Further trigonometric identities and their applications |
| **Statistics** |
| Mathematical models in probability and statistics |
| Representation and summary of data- location |
| Representation and summary of data - measures of dispersion |
| Representation of data |
| Probability |
| Correlation |
| Regression |
| Discrete random variables |
| The normal distribution |