Year 7

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

|  |  |
| --- | --- |
| 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**

|  |  |
| --- | --- |
| 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**

|  |  |
| --- | --- |
| 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 13Symmetry 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**

|  |  |
| --- | --- |
| 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**

|  |  |
| --- | --- |
| 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**

|  |  |
| --- | --- |
| 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**

|  |  |  |
| --- | --- | --- |
| 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**

|  |  |  |
| --- | --- | --- |
| 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 $n$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**

|  |  |  |
| --- | --- | --- |
| 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**

|  |  |  |
| --- | --- | --- |
| 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 $a : b$ and $a : b : c$, where $a$, $b$ and $c$ 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**

|  |  |  |
| --- | --- | --- |
| 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, U8Y8 U6 |

**Summer 2 ~ handling data**

|  |  |  |
| --- | --- | --- |
| 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 |

|  |  |
| --- | --- |
| **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  |
|  |
| 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

|  |  |
| --- | --- |
| **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 |

|  |  |
| --- | --- |
| **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**

|  |
| --- |
| **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 |