**Assessment in Maths**

| Assessment (Written) | Essential Component of Understanding/Application | Why is this essential? | Misconceptions Often Addressed |
|---|---|---|---|
| Aut1 - Sequences | • Drawing and counting terms<br>• Finding the next 2 terms<br>• Continue a sequence from diagrams<br>• Identify a linear sequence<br>• Write a linear sequence<br>• Continue a geometric sequence<br>• Continue a picture pattern<br>• Complete a table and recognise if the points would lie on a straight line<br>• Find missing numbers in a sequence<br>• Find the next 2 triangular numbers<br>• Write linear sequences from a list of numbers | Y8 - more complex rules and nth term<br>Y9 - testing conjectures<br>Y10 - names and types of sequences | Geometric and arithmetic |
| Aut2 – Algebraic Notation | • Find the output for addition and subtraction<br>• Find the input and function for multiplication<br>• Find the inverse function for subtraction<br>• Simplify simple expressions<br>• Write the output as an expression<br>• Substitution<br>• Use function machines in algebra<br>• Harder substitution<br>• Recognise the equation of a straight-line graph<br>• Order of calculation and function machines<br>• Generate a sequence given the nth term | Y8 – more complex expressions, work with indices<br>Y10 – powers and roots<br>Y11 – formulae and functions | Substitution into multiplied terms<br><br>Inverse functions |

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| Aut3 – Equality and Equivalence | • Fact family for addition and subtraction<br>• Fact family for multiplication and division<br>• Solve 1 step equations<br>• Write an equation with a given solution<br>• Write and solve an equation<br>• Sort like terms<br>• Identify equivalent terms<br>• Simplify expressions<br>• Write an expression<br>• Know that addition is commutative | Y8 – expand a single bracket, formulae, functions, identities and expressions<br>Y9 – change the subject of the formula, testing algebraic conjectures<br>Y10 – factorising quadratics<br>Y11 – completing the square | Thinking that a squared and 2a are the same<br><br>A + 7 = 7A |
| Aut4 – Place Value | • Place value with integers<br>• Compare any number<br>• Calculate the range and median<br>• Place value with decimals<br>• Rounding a decimal<br>• Position integers on a number line<br>• Position a decimal on a number line<br>• Write the value of a digit<br>• Problem with median and range<br>• Understand powers of 10<br>• Order numbers written in Standard Form | Y8 – Standard form<br>Y9 – HCF and LCM, Rational and Real Numbers<br>Y10 – Bounds, Limits of Accuracy<br>Y11 – Product Rule for counting | Rounding |
| Aut5 – Fractions, Decimals, Percentages | • Write a percentage and fraction from a 100 square<br>• Compare fractions, decimals, and percentages<br>• Position fractions and decimals on a number line<br>• Reading percentages from a Pie Chart<br>• Shade a fraction on a diagram<br>• Complete equivalent fractions<br>• Use equivalent fractions to decide which is the largest fraction | Y8 – Express one number as a fraction of another<br>Y10 – Ratios and Fractions<br>Y11 – Multiplicative change | Equivalent fractions<br><br>Fraction as division<br><br>Ordering fractions with different denominators |

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| | • Write a division as a fraction and simplify and as a decimal<br>• Order fractions<br>• Continue a sequence whose terms are given as fractions, decimals, and percentages | | |
| Spr1 – Addition and Subtraction | • Understand and use a place value grid<br>• Addition and subtraction calculations<br>• Complete a bar model for addition<br>• Addition and subtraction with decimals<br>• Addition with decimals, including shape<br>• Complete a frequency tree<br>• Complete and read from a two-way table<br>• Find a missing number using perimeter<br>• Intervals on number lines<br>• Find terms in a linear sequence<br>• Calculations with standard form | Y8 – Circumference, data, charts, tables<br>Y9 – Financial maths<br>Y10 – Circumference, arc length, compare distributions<br>Y11 – cumulative frequency, box plots, histograms | |
| Spr2 – Multiplication and Division | • Calculate area of a rectangle<br>• Calculate area of a parallelogram<br>• Multiplication and division facts<br>• Multiplication of integers<br>• Division of integers<br>• Multiplication with money<br>• Complete a Venn diagram with factors<br>• Calculate the mean<br>• Calculations with metric units of length<br>• Multiplication with decimals<br>• Understand order of operations<br>• Substitution<br>• Calculate the area of a trapezium | Y8 – multiply and divide with fractions, currency conversions, conversion graphs, area of trapezium, circle and compound shapes<br>Y9 – scale drawing, surface area of 3d shapes<br>Y10 – work with exact answers, area of sectors, surface area of cylinders and spheres and cones<br>Y11 - | Converting metric units<br><br>Money calculations<br><br>Multiplying decimals |

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| Spr3 – Fractions and Percentages | • Calculate the unit fraction of an integer using a bar model<br>• Calculate the fraction of an integer using bar models<br>• Simple percentages of an amount problem involving money<br>• Given the fraction of a number, calculate that number<br>• Calculate the percentage of an amount<br>• Calculator method to calculate the percentage of an amount<br>• Matching fractions and percentages of amounts<br>• Write the answer to a money calculation correctly<br>• Use fractions greater than 1 and percentages greater than 100%<br>• Complex calculation involving the percentage of a fraction of an amount | Y8 – explore calculator methods, % increase/decrease, multipliers and % change<br>Y9 – Reverse percentages, financial maths<br>Y10 – ratio and fractions, simple/compound interest, original values, repeated % change<br>Y11 – Multiplicative change, 'show that' problems with percentage | |
| Spr4 – Directed Numbers | • Use inequality signs<br>• Read and use a table of temperatures<br>• Subtract directed numbers<br>• Use an addition pyramid containing negative numbers<br>• Write multiplication and division fact family with negative numbers<br>• Substitute negative numbers and evaluate expressions<br>• Solve 2 step linear equations containing negative numbers<br>• Use order of calculation with negative numbers<br>• Know that there are 2 solutions to a square root<br>• Powers with negative numbers | Y8 – Simplifying, use identities, formulae and expressions<br>Y9 – rearranging formula<br>Y10 – Changing the sunject of the formula | Subtracting a negative<br><br>Order of calculations<br><br>Square root |

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| Spr5 – Fractional Thinking | • Understand how to use a diagram to illustrate a fraction<br>• Write an equivalent fraction<br>• Write fractions from a number line<br>• Add and subtract fractions with a common denominator<br>• Add 2 fractions when 1 needs to be rewritten to have the same denominator as the other<br>• Complete a part-whole model with a mixed number<br>• Write mixed numbers as improper fractions<br>• Add mixed numbers<br>• Add a fraction and a decimal<br>• Use inequality and equal signs in calculations with fractions and decimals<br>• Substitute fractions into expressions and evaluate<br>• Subtraction problem with mixed numbers<br>• Add algebraic fractions | Y9 – Fraction arithmetic<br>Y10 – Algebraic Fractions | Finding a common denominator<br><br>Dealing with mixed numbers<br><br>Substitution fractions |
| Sum1 – Constructing and Measuring | • Draw a line<br>• Draw an angle<br>• Identify an obtuse angle<br>• Label angles and lines<br>• Identify a scalene triangle<br>• Know the names of quadrilaterals and other polygons<br>• Construct an equilateral triangle: SSS<br>• Construct a triangle given SAS<br>• Draw a pie chart | Y8 – explore diagonals of quadrilaterals<br>Y9 – test conjectures about shapes<br>Y10 – shape in context of enlargement<br>Y11 – shape reasoning | Using a protractor<br><br>Correct use of letters for labelling |
| Sum2 – Geometric Reasoning | • Find missing angles on a straight line<br>• Find missing angles in a triangle<br>• Find missing angles in a full turn | Y8 – Angles in parallel lines, prove geometric facts | Angles on a straight line |

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| | • Find angles in an isosceles triangle<br>• Understand and use vertically opposite angles<br>• Form an equation and use to find the angles in a triangle<br>• Find missing angles in a quadrilateral<br>• Find angles in parallel lines<br>• Find angles in a hexagon | Y9 – chains of reasoning, angles, congruency,<br>Y10 – bearings, proof with angles, congruent triangles, circle theorems, vectors<br>Y11 – circle theorems | |
| Sum3 – Developing Number Sense | • Identify equivalent calculations involving addition and subtraction of integers<br>• Add decimals<br>• Identify equivalent calculations involving multiplication of integers<br>• Estimation and exact calculations for money problem<br>• Problem involving fraction of an amount<br>• Understand and use 'inequality' and 'equal' signs<br>• Use a calculation and its answer to find missing numbers in a related calculation<br>• Use known algebraic facts to derive other facts | Y8 – indices, complex expressions,<br>Y9 – conversions, proportion<br>Y10 – unit pricing<br>Y11 – functions, pressure and density | |
| Sum4 – Sets and Probability | • Write simple probabilities for a single event<br>• Match sets to their description<br>• List the elements of sets<br>• Write probabilities for information given in a table<br>• Complete and use a Venn diagram<br>• Combine probabilities and know that probabilities add up to 1<br>• Mark probabilities on a probability scale | Y8 – sample spaces, tables, venn diagrams<br>Y9 – experimental and theoretical probability, frequency trees for probability, simple tree diagrams<br>Y10 – sample size and probability, tree diagrams, mutually exclusive and independent events, conditional probability | |

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| | • List the elements in the complement of a set | | |
| Sum 5 – Prime Numbers and Proof | • Understand and use factors and multiples<br>• Match sequences and their name<br>• Understand prime numbers<br>• Find the highest common factor<br>• Lowest common multiple problem<br>• Test conjectures<br>• Write a number as a product of its prime factors<br>• Find the lowest common multiple | Y8 – indices, rounding, standard form<br>Y9 – Standard Form, HCF and LCM, rational and real numbers, prime factorisation<br>Y11 – proving equivalence of different forms of number | HCF and LCM difference |

**Year 7**

**What happens following an assessment to address pupil misconceptions and reteaching of essential knowledge?**

- All assessments are covered and green penned in class,
- The pupils complete evaluation sheets working out EBI, WWW and MRI. This then highlights their individual strengths and weaknesses within the topic
- Within the following topic there are starters covering the previous topic so retrieval practice is key

**Formative Assessment in Maths**

- Questioning
- White boards

**Feedback and Acting on Feedback (should be on the most valuable thing)**

- Every assessment has feedback that the pupil acts upon

**Year 8**

| Assessment (Written) | Essential Component of Understanding/Application | Why is this essential? | Misconceptions Often Addressed |
|---|---|---|---|
| Aut 1 – Ratio and Scale | • Understand meaning and representation of ratio<br>• Ratio notation<br>• Ratio in for 1:n<br>• Ratio in for m:n<br>• Divide into a given ratio<br>• Simplify ratio<br>• Ratios to fractions<br>• Understand Pi as a ratio between diameter and the circumference<br>• Gradient of a line as ratio | • Y9 Solving ratio and proportion problems<br>• Y9 Straight line graphs<br>• Y10 working with circles | • Ratio written incorrectly<br>• Ratio to fraction, one over the other instead of total<br>• Not dividing correctly for 1:n |
| Aut 2 – Multiplicative change | • Direct proportion<br>• Conversion Graphs<br>• Converting currencies<br>• Direct proportion graphs<br>• Similar shapes<br>• Scale factor<br>• Scale diagrams<br>• Maps –scale factors and ratios | • Y9 solve ratio and proportion problems<br>• Y9 enlargement and similarity<br>• Y9 straight line graphs<br>• Y10 Congruence, similarity and enlargement | • Reading from graph incorrectly<br>• Not drawing line to read off<br>• Incorrect multiplier<br>• Graph not at 0,0 |
| Aut 3 – Multiplying and Dividing Fractions | • Represent multiplication of unit fractions<br>• Multiply a fraction by an integer<br>• Multiply a pair of fractions<br>• Divide fractions<br>• Understand what finding the half of a fraction means<br>• Compare the answers to multiplication of fraction questions<br>• Match equivalent multiplication and division calculations | • Y9 Number<br>• Y10 Ratios and Fractions<br>• Y10 Percentages and Interest<br>• Y11 Multiplicative reasoning<br>• Y11 Show that | • Multiplying numerator and denominator<br>• Only multiplying denominator<br>• Half of, dividing<br>• Incorrect simplification<br>• Diving numerator and denominator<br>• Not multiplying by reciprocal for divide<br>• Area of shape |

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| | • Calculate the area of a rectangle if the length and width are given as fractions | | |
| Aut 4- Working in the cartesian Plane | • Plot co-ordinates in all four quadrants<br>• Identify and draw lines parallel to an axis<br>• Draw a straight line from a given equation<br>• Identify lines parallel to an axis<br>• Identify the equation of a line given the line<br>• Identify and use gradient<br>• Find the midpoint of a line segment<br>• Identify non-linear graphs | • Y9 Straight Line Graphs<br>• Y9 Algebraic representation<br>• Y10 representing solutions of equations and inequalities<br>• Y10 Simultaneous equations<br>• Y11 gradients and Lines<br>• Y11 Non-Linear Graphs | • X,y incorrect way<br>• Going up y before along x<br>• Incorrect coordinates<br>• Substitution incorrect<br>• Parallel and perpendicular<br>• M and c wrong way in y=mx+c<br>• Not understanding the definition of linear |
| Aut 5 – Representing Data | • Types of data<br>• Completing a frequency table<br>• Describe the correlation on a scatter graph<br>• Read a grouped frequency table<br>• Complete a scatter graph<br>• Identify an outlier on a scatter graph<br>• Draw and use a line of best fit on a scatter graph<br>• Complete a 2-way table<br>• Read a frequency table | • Y9 probability<br>• Y 10 Angles and Bearings<br>• Y 11 Listing and describing | • Incorrect class intervals<br>• Inequalities<br>• Incorrect correlation<br>• Line of best fit (0,0)<br>• |
| Aut 6 – Tables and Probability | • Write the probability of a single event<br>• List all possible combinations of sandwich<br>• Complete a 2-way table | • Y9 Probability<br>• Y10 Probability<br>• Y11 Listing and Describing | • Incorrect fraction<br>• Missing combinations, repeated combinations<br>• Totals incorrect |

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| | • Write probabilities from the 2-way table<br>• List all the possible outcomes for 1 event<br>• Complete a sample space diagram<br>• Write probabilities from the sample space diagram<br>• Read a Venn diagram and write a probability<br>• Complete a Venn diagram<br>• List all possible outcomes for 2 events | | • Probability out of 1<br>• Data outside set in Venn diagram<br>• Repeated data in Venn |
| Spr 1 – Brackets, Equations and Inequalities | • Understand algebraic notation<br>• Expand brackets<br>• Expand brackets and simplify<br>• Solve two step equations<br>• Factorise expressions<br>• Solve inequalities<br>• Writing expressions<br>• Form and solve equations with shape<br>• Form quadratic expressions | • Y9 forming and solving equations<br>• Y9 Algebraic representations<br>• Y10 representing solutions of equations and inequalities<br>• Y10 Simultaneous equations<br>• Y11 Expanding and factorising | • Collecting incorrect like terms<br>• Adding brackets first<br>• Only multiplying one term<br>• Missing signs<br>• Multiples instead of factors<br>• Not using HCF |
| Spr 2 - Sequences | • Work out missing terms in a sequence<br>• Recognise linear and non-linear sequences<br>• Write terms in a sequence given a rule<br>• Given the term, write terms in the sequence<br>• Decide if a term is in a given sequence | • Y9 Testing conjectures<br>• Y9 Revision<br>• Y10 Types of number and sequences<br>• Y11 Algebraic reasoning | • Calculating differences incorrectly<br>• Always starting at 1<br>• Always starting from term 1<br>• Incorrect squaring |

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| | • Write terms of a quadratic sequence<br>• Match given terms with a term<br>• Find the nth term of a linear sequence | | |
| Spr 3 - Indices | • Collect like terms with powers<br>• Multiply algebraic terms<br>• Recognise and correct identities<br>• Laws of indices for multiplying powers<br>• Laws of indices for dividing powers<br>• Laws of indices for raising a power to a power<br>• Mixed laws of indices | • Y9 Straight line graphs<br>• Y9 Forming and solving equations<br>• Y9 testing conjectures<br>• Y9 Algebraic representation<br>• Y10 Representing solutions to equations and inequalities<br>• Y10 Simultaneous equations<br>• Y10 indices and roots<br>• Y11 Functions | • Collecting all the same variables ignoring powers<br>• Not using powers, using coefficients<br>• Using incorrect law<br>• Using law with different base |
| Spr 4 – Fractions and Percentages | • Write fractions, decimals, and percentages on a number line<br>• Know which multiplier to use perform a percentage change<br>• Write 1 number as a percentage of another<br>• Calculate a price following a percentage decrease using a multiplier<br>• Calculate the percentage of a percentage of an amount<br>• Calculate the number of pupils after a percentage decrease and increase<br>• Workout what percentage loss has been made<br>• Calculate the price before a reduction (reverse percentage) | • Y9 Using percentages<br>• Y9 Maths and Money<br>• Y10Percentages and interest<br>• Y10 Non-calculator methods<br>• Y11 Show that | • Incorrect spacing<br>• Writing one as a percentage of another always over 100<br>• Not using a decimal multiplier and using an integer<br>• Calculating percentage but not adding to price to increase<br>• Using incorrect loss<br>• Taking the amount off the already discounted price |

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| Spr 5 – Standard Index Form | • Understand powers of 10<br>• Write numbers in standard form as ordinary numbers<br>• Use inequality and equal signs to compare numbers written in standard form<br>• Calculate with numbers in standard form<br>• Add numbers in standard form<br>• Show that 2 calculations are equivalent<br>• Write the answer to a multiplication problem in standard form<br>• Order powers of 8 involving negative and fractions indices | • Y9 numbers<br>• Y9 revision<br>• Y10 Non-calculator methods<br>• Y10 types of number and sequences<br>• Y10 indices and roots<br>• Y11 listing and describing<br>• Y11 show that<br>• Y11 revision | • Writing all numbers as integers and not below 10<br>• Misunderstanding place value for negative indices<br>• Using fractional indices as division<br>• Using indices on base numbers as standard form |
| Spr 6 – Number Sense | • Round an integer to the nearest 10<br>• Round an integer to 1 significant figure<br>• Round a decimal to the nearest integer<br>• Round a decimal to 1 decimal place<br>• Use rounding to check the answer to a multiplication of 2 decimals<br>• Calculate with money<br>• Work out the number of days between 2 dates<br>• Use inequality and equal signs to compare measures in metric units<br>• Solve a problem involving time in the 24-hour clock | • Y9 Numbers<br>• Y9 Maths and money<br>• Y10 Non calculator methods<br>• Y10 indices and roots<br>• Y11 Multiplicative reasoning<br>• Y11 revision | • Incorrect rounding<br>• Using zero as first sig fig<br>• Using more than 2 dp for money<br>• Incorrect place value when adding/subtracting<br>• Conversions |

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| | • Write which 2 integers the square root of a number lies between<br>• Complete an error interval involving mass<br>• Order areas given in different metric units | | |
| Sum 1 – Angles in parallel lines and polygons | • Understand and use basic angles rules and notation<br>• Investigate angles between parallel lines and the transversal<br>• Identify and calculate with alternate and corresponding angles<br>• Identify and calculate with co-interior, alternate and corresponding angles<br>• Solve complex problems with parallel line angles<br>• Constructions triangles and special quadrilaterals<br>• Investigate the properties of special quadrilaterals<br>• Identify and calculate with sides and angles in special quadrilaterals | • Y9 deduction<br>• Y10 angles and bearings<br>• Y11 Geometric reasoning | • Angle notation<br>• Angle rules<br>• Parallel lines<br>• Shape |
| Sum 2 – Area of trapezia and circles | • Calculate the area of triangles, rectangles and parallelograms<br>• Calculate the area of a trapezium<br>• Calculate the perimeter and area of compound shapes (1)<br>• Investigate the area of a circle<br>• Calculate the area of a circle and parts of a circle without a calculator<br>• Calculate the area of a circle and parts of a circle with a calculator<br>• Calculate the perimeter and area of compound shapes (2) | • Y9 three dimensional shapes<br>• Y10 working with circles<br>• Y10 non calculator methods<br>• Y11 changing the subject<br>• Y11 revision | • Shapes<br>• Units<br>• Area/perimeter<br>• Pi |
| Sum 3 – Line symmetry and reflection | • Recognise line symmetry | • Y9 constructions and congruency | • Reflect/rotate<br>• Shape moves |

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| | • Reflect a shape in a horizontal or vertical line 1 (shapes touching the line)<br>• Reflect a shape in a horizontal or vertical line 2 (shapes not touching the line)<br>• Reflect a shape in a diagonal line 1 (shapes touching the line)<br>• Reflect a shape in a diagonal line 2 (shapes not touching the line) | • Y9 Rotation and Translation<br>• Y10 Congruency, similarity and enlargement<br>• Y10 Working with circles<br>• Y11 Transforming and Constructing<br>• Y11 Listing and describing | • Shape changes size<br>• Mirror line |
| Sum 4 – The data handling cycle | • Set up a statistical enquiry<br>• Design and criticise questionnaires<br>• Draw and interpret pictograms, bar charts and vertical line charts<br>• Draw and interpret multiple bar charts<br>• Draw and interpret pie charts<br>• Draw and interpret line graphs<br>• Choose the most appropriate diagram for given set of data<br>• Represent and interpret grouped quantitative data<br>• Find and interpret the range<br>• Compare distributions using charts<br>• Identify misleading graphs | • Y9 probability<br>• Y10 Collecting, representing and interpreting data<br>• Y11 Listing and describing | • Incorrect axes<br>• Axes scale<br>• totals |
| Sum 5 – Measures of location | • Understand and use the mean, median and mode<br>• Choose the most appropriate average<br>• Find the mean from an ungrouped frequency table<br>• Find the mean from a grouped frequency table<br>• Identify outliers Compare distributions using averages and the range | • Y9 Revision<br>• Y10 collecting, representing and interpreting data<br>• Y11 Listing and describing | • Averages<br>• Tables |

**Year 8**

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- Within the following topic there are starters covering the previous topic so retrieval practice is key

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- Questioning
- White boards

**Feedback and Acting on Feedback (should be on the most valuable thing)**

- Every assessment has feedback that the pupil acts upon

**Year 9**

| Assessment (Written) | Essential Component of Understanding/Application | Why is this essential? | Misconceptions Often Addressed |
|---|---|---|---|
| Aut1-Straight line graphs | • Read coordinates and write the equations of vertical and horizontal lines<br>• Complete a table of points and draw a graph<br>• Work out the gradient of a line segment<br>• Identify the graphs which go through a given point<br>• Write down the gradient and intercept given the equation of a line<br>• Work out the equation of a line from a graph<br>• Use a real-life graph and find its equation<br>• Recognise inverse proportion | • Y10 Solve linear simultaneous equations graphically<br>• Y11 perpendicular lines<br>• Y11 Equation of the tangent to a circle | • Coordinates read the wrong way<br>• Labelling scale on axes incorrectly<br>• Counting squares rather than using the scale when finding the gradient |
| Aut2-Forming and solving equations | • Solve 1-step linear equations<br>• Solve 2-step linear equations<br>• Solve a linear equation containing brackets<br>• Solve a linear inequality<br>• Write an equation with the unknown on both sides and solve it<br>• Solve an inequality when the term containing the unknown is negative<br>• Rearrange the equation of a straight line<br>• Change the subject of a formula | • Y10/11 Factorising quadratics of the form x2+bx+c<br>• Y10 Represent solutions to inequalities on number lines<br>• Y10 Form and solve linear simultaneous equations<br>• Y10 Solve quadratic equations and inequalities by factorising<br>• Y10 Solve simultaneous equations, one linear and one quadratic<br>• Y11 Change the subject of a formula | • Not recognising the necessary operation to find the unknown (undoing)<br>• Incorrect use of negative numbers<br>• Dividing by a negative when solving inequllaities |

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| | | • Y11 Change the subject of a formula where the subject appears more than once<br>• Y11 Form and solve quadratic equations by factorising<br>• Y11 Solve quadratic equations using the formula and completing the square | |
| Aut3-Testing conjectures | • Identify prime numbers<br>• Use true or false statements about factors, multiples, and solving equations<br>• Use always true, sometimes true, and never true statements about multiples and primes<br>• Show that a percentage of a quantity is the same as the fraction of another quantity<br>• Expand single brackets<br>• Expand a pair of binomials<br>• Test conjectures about a sequence given its nth term<br>• Explore the 100-hundred grid | • Y10 Names and types of sequences<br>• Y10 Shape names and properties in the context of enlargement | • 1 is not a prime number<br>• Mixing up factors and multiples |
| Aut4-Three dimensional shapes | • Matching 3D shapes<br>• Recognise prisms<br>• Complete the net of a cube<br>• Calculate the volume of a cuboid<br>• Draw elevations<br>• Calculate the volume of a prism<br>• Calculate the surface area of a cube and a cylinder<br>• Calculate the volume of a sphere | • Y10 Area and circumference of a circle<br>• Y10 Arc length<br>• Y10 Area of a sector<br>• Y10 Surface areas and volumes of cylinders, cones and spheres<br>• Y10 Non-calculator methods<br>• Y10 Parts of a circle | • Confusing volume and surface area<br>• Substituting the diameter instead of the radius |

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| | | • Y11 Perimeter, area and volume as a context for rearrangement<br>• Y11 Volume of a pyramid<br>• Y11 Shape properties in the context of reasoning | |
| Aut5-Constructions and Congruency | • Types of angles<br>• Use a scale<br>• Identify pairs of congruent shapes<br>• Construct an equilateral triangle<br>• Construct the locus of points equidistant from a line<br>• Construct the bisector of an angle<br>• Construct the perpendicular from a point to a line<br>• Draw the locus of points that are equidistant from a point<br>• Identify congruent triangles and state the condition for congruency | • Y10 Similar shapes<br>• Y10 Enlargement<br>• Y10 Area and volume similarity<br>• Y10 Negative scale factors of enlargement<br>• Y10 Proof with angle rules<br>• Y10 Prove shapes are similar<br>• Y10 Congruent triangles<br>• Y10 Proving triangles are congruent<br>• Y11 Loci<br>• Y11 Prove and use the remaining circle theorems | • Difference between similarity and congruence |
| Spr1-Numbers | • Recognise an integer<br>• Multiplication<br>• Addition of Fractions<br>• Directed Numbers<br>• Highest Common Factor<br>• Subtraction<br>• Division of Fractions<br>• Standard Form | • Y10 Rounding and limits of accuracy<br>• Y10 Upper and lower bounds<br>• Y10 Converting recurring decimals<br>• Y10 Work with exact numbers | • Integer<br>• Knowing when a common denominator is necessary |

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| | • Surds | • Y10 Calculate with surds<br>• Y10 Work with ratios and fractions<br>• Y10 Conversions<br>• Y10 Converting fractions and decimals<br>• Y11 Making ordered lists<br>• Y11 Product rule for counting<br>• Y11 Proving equivalence of different forms of number<br>• Y11 Multiplicative change including fractions and decimals<br>• Y11 Proving equivalence | |
| Spr2-Using percentages | • Convert a fraction to a percentage<br>• Identify the multiplier for a percentage change.<br>• Calculate the new amount following a simple percentage increase<br>• Compare a fraction with a percentage<br>• Calculate the percentage profit<br>• Calculate the new amount following a percentage increase<br>• Calculate the monthly payments following a deposit.<br>• Find an original amount<br>• Compare percentage change<br>• Compound depreciation | • Y10 Simple and compound interest<br>• Y10 Finding original values<br>• Y10 Repeated percentage change<br>• Y10 Growth and decay problems<br>• Y10 Iterative process<br>• Y10 Conversions and non-calculator methods<br>• Y10 Ratios and fractions | • Recognise reverse percentages |

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| | | • Y10 Ratios in the context of area and volume<br>• Y11 'Show that' problems with percentages<br>• Y11 Gradients and curves<br>• Y11 Estimate the area under a curve | |
| Spr3-Maths and money | • Read and use a bank statement<br>• Calculate a price including VAT<br>• Calculate weekly earnings<br>• Use an exchange rate<br>• Determine the best value for money<br>• Calculate the amount of compound interest<br>• Calculate the monthly payments of a credit agreement<br>• Calculate the amount of income tax | • Y10 Work with powers and roots<br>• Y10 Calculate with standard form<br>• Y10 calculate with surds | • Debit v credit<br>• Comparing like for like |
| Spr4-Deduction | • Calculate missing angle on a straight line and give reasons<br>• Know and use that vertically opposite angles are equal<br>• Know and use that the opposite angles in a parallelogram are equal<br>• Know the reasons for equal angles in parallel lines<br>• Know and use that fact that there are 360° in a full turn<br>• Know properties of quadrilaterals<br>• Form and solve an equation to show that a triangle is right-angled<br>• Justify whether a conjecture about angles in a pentagon is correct or not<br>• Construct a perpendicular bisector of the diagonal of a rectangle<br>• Know the name of the quadrilateral formed. | • Y10 Interpret and use bearings<br>• Y10 Prove and use the first 4 circle theorems<br>• Y11 Use correct language in 'show that'/proof questions<br>• Y11 Congruent triangle proofs | |

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| Spr5-Rotation and translation | • Identify shapes which have rotational symmetry of order 2<br>• Understand column vectors for translations<br>• Rotate a shape about a point on the shape<br>• Translate a shape by a given vector<br>• Know that for some shapes the order of rotational symmetry is equal to the number of lines of symmetry<br>• Describe a reflection<br>• Describe a rotation<br>• Find the coordinates of a point on a shape before a translation<br>• Show the position of a shape following a combined transformation | • Y10 Parts of a circle<br>• Y11 Plans and elevations | • Describe a single transformation. When ask, not a combination<br>• A rectangle only has 2 lines of symmetry<br>• A parallelogram has no lines of symmetry |
| Spr6-Pythagoras' Theorem | • Calculate the area of a square<br>• Calculate the side of a square given the area<br>• Know Pythagoras' Theorem<br>• Use Pythagoras' Theorem to calculate the hypotenuse of a right-angled triangle<br>• Use Pythagoras' Theorem to calculate a shorter side of a right-angled triangle<br>• Work out the diagonal of a square given its perimeter<br>• Given the sides of a triangle, use Pythagoras' Theorem to decide if it is right-angled<br>• Find the distance between a pair of coordinates<br>• Calculate the height of a square-based pyramid given the length of the base and the slant height | • Y10 Pythagoras Theorem<br>• Y10 Use trigonometry to find missing sides and angles in right angled triangles<br>• Y10 Exact trig values<br>• Y10 Using the sine and cosine rules<br>• Y10 Area of a general triangle<br>• Y10 Pythagoras and trigonometry in the context of bearings<br>• Y10 Understand and use vectors<br>• Y10 Geometric proof with vectors<br>• Y11 trigonometry in the context of functions<br>• Y11 Trigonometry when exploring | • Subtract when finding a short side |

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| | | trigonometric graphs and transformations of these | |
| Sum1-Enlargement and similarity | • Identify similar shapes<br>• Draw an enlargement with a positive integer scale factor<br>• Calculate scale factors and sides in similar shapes<br>• Draw an enlargement using a centre of rotation with a positive integer scale factor<br>• Draw an enlargement using a coordinate point as the centre of enlargement with a positive integer scale factor<br>• Calculate scale factors, sides, and angles in similar shapes<br>• Draw an enlargement using the origin as the centre of enlargement with a negative integer scale factor | | • An enlargement with a negative scale factor greater than 1 gets larger.<br>• Scale factor are 'multipliers' |
| Sum2-Solving ratio and proportion problems | • Complete a table for direct proportion<br>• Identify graphs for direct proportion<br>• Sharing an amount in a given ratio problem<br>• Inverse proportion problem<br>• Sharing an amount in a given ratio involving a difference<br>• Best value for money problem<br>• Algebra problem | • Y10 Area and volume similarity with cones etc<br>• Y10 Unit pricing, best buys<br>• Y10 Currency conversions<br>• Y10 Area and volume similarity<br>• Y11 Direct and inverse proportion numerically and graphically | • Recognise inverse proportion |
| Sum3-Rates | • Find distance given speed and time<br>• Write a decimal time in hours and minutes<br>• Calculate speed given distance and time<br>• Hours, days, and weeks problem<br>• Reading a distance-time graph | • Y11 Pressure and density<br>• Y11 Variation with powers and roots | • Use of triangles (s,d,t or m,v,d) correctly<br>• Hours and minutes as a decimal |

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| | • Read a flow graph<br>• Calculate the density of a block<br>• Average speed problem<br>• Calculate time taken to fill a tank<br>• Convert and compare compound units | | |
| Sum4-Probability | • Write the simple probabilities for single events<br>• Probabilities about even and prime numbers<br>• Understand and use relative frequency<br>• Know that probabilities add up to one and use a probability to make an estimate<br>• Complete and use a 2-way table<br>• Combine probabilities for independent events<br>• Complete and use a tree diagram | • Y10 factors, multiples and primes<br>• Y10 Standard Form<br>?<br>• Y10 Effect of sample size on estimated probabilities<br>• Y10 Use tree diagrams<br>• Y10 Mutually exclusive and independent events<br>• Y10 Conditional probabilities<br>• Y11 Use sample spaces and probability rules | • Write probabilities correctly as fractions, decimals, percentages only |
| Sum5-Algebraic representations | • Complete a table of points for a quadratic<br>• Draw a quadratic graph<br>• Read an exponential graph<br>• Show and write inequalities on a number line<br>• Write an inequality represented by a region on a graph<br>• Draw graphs and shade a region to represent an inequality<br>• Draw graphs and shade a region to represent 2 inequalities<br>• Draw and use straight lie graphs to solve a pair of simultaneous equations | • Y10 Work with powers and roots<br>• Y10 maintain equivalence using the rules of indices<br>• Y10 Solve linear and quadratic simultaneous equations graphically<br>• Y10 Find the rule for the nth term of a quadratic sequence<br>• Y10 Sequences with surds | • Square of a negative is positive |

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| | | • Y11 Substitute in kinematics formulae<br>• Y11 Functions<br>• Y11 Composite and inverse functions<br>• Y11 Algebraic proof<br>• Y11 Roots, quadratic, cubic and reciprocal graphs<br>• Y11 Equations of circles<br>• Y11 Real-life graphs including speed/distance/time<br>• Y11 Trig graphs<br>• Y11 transforming graphs | |

**Year 9**

**What happens following an assessment to address pupil misconceptions and reteaching of essential knowledge?**

- All assessments are covered and green penned in class,
- The pupils complete evaluation sheets working out EBI, WWW and MRI. This then highlights their individual strengths and weaknesses within the topic
- Within the following topic there are starters covering the previous topic, so retrieval practice is key

**Formative Assessment in Maths**

- Questioning
- White boards

**Feedback and Acting on Feedback (should be on the most valuable thing)**

- Every assessment has feedback that the pupil acts upon

**Year 10**

| Assessment (Written) | Essential Component of Understanding/Application | Why is this essential? | Misconceptions Often Addressed |
|---|---|---|---|
| Autumn End of Term Assessment | • Similarity<br>• Congruence<br>• Enlargement<br>• Trigonometry<br>• Equations and inequalities<br>• Simultaneous Equations | For GCSE<br>To progress to A-level studies in Mathematics as good basics for Advanced topics | Not understanding the difference between similar and congruent<br>Enlargement can also make shapes smaller<br>Negative scale factors<br>Inequality signs<br>Inequalities on graphs<br>Inverse operations<br>Solving for 2 unknowns at the same time<br>Solving a linear and quadratic at the same time. |
| Spring End of Term Assessment | • Angles<br>• Bearings<br>• Circles<br>• Ratios<br>• Fractions<br>• Percentages and interest<br>• Probability | For GCSE<br>To progress to A-level studies in Mathematics as good basics for Advanced topics | |
| Mock Exams (All 3 Papers) | • All GCSE topics will be covered over the 3 papers at Foundation or Higher Level | For GCSE<br>To progress to A-level studies in Mathematics as good basics for Advanced topics | |

**Year 10**

**What happens following an assessment to address pupil misconceptions and reteaching of essential knowledge?**

- Evaluation Sheets are completed and Mircosoft Forms completed to highlight key areas for teaching and learning
- All assessments are corrected and green penned in class,
- The pupils complete evaluation sheets working out EBI, WWW and MRI. This then highlights their individual strengths and weaknesses within the topic
- GCSE practice questions will be used as starters in the following terms to address weaker areas

**Formative Assessment in Maths**

- Questioning
- White boards

**Feedback and Acting on Feedback (should be on the most valuable thing)**

- Every assessment has feedback that the pupil acts upon

**Year 11**

| Assessment (Written) | Essential Component of Understanding/Application | Why is this essential? | Misconceptions Often Addressed |
|---|---|---|---|
| Paper 1 Non Calculator | • All GCSE topics will be covered over the 3 papers at Foundation or Higher Level | For GCSE<br>To progress to A-level studies in Mathematics as good basics for Advanced topics | |
| Mock Exams (All 3 Papers) | | | |
| Paper 2 Calculator | | | |
| Paper 3 Calculator | | | |
| All 3 GCSE Papers over 6 weeks | | | |

**Year 11**

**What happens following an assessment to address pupil misconceptions and reteaching of essential knowledge?**

- Evaluation Sheets are completed and Mircosoft Forms completed to highlight key areas for teaching and learning
- All assessments are corrected and green penned in class,
- The pupils complete evaluation sheets working out EBI, WWW and MRI. This then highlights their individual strengths and weaknesses within the topic
- GCSE practice questions will be used as starters in the following terms to address weaker areas

**Formative Assessment in Maths**

- Questioning
- White boards

**Feedback and Acting on Feedback (should be on the most valuable thing)**

- Every assessment has feedback that the pupil acts upon