Year 7	Half Term 1	Half Term 2	Half Term 3
Key Topics	Unit 1 Solve Problems with Addition & Subtraction Unit 2 Solve Problems with Multiplication & Division Unit 3 Directed Numbers	Unit 4 Algebraic Notation Unit 5 Equality and Equivalence Unit 6 Sequences	Unit 7 Place Value & Ordering Unit 8 Fractions, Decimals and Percentages Equivalence
Substantive Knowledge **(Bold is higher tier only)**	• Apply the properties of adding and subtracting to integers and decimals (and inverse operations) • Use mental and formal strategies for adding and subtracting integers • Solve problems involving perimeter • Solve problems involving bar charts and line charts • Use standard units of time • **Solve financial maths problems** • **Solve problems involving tables and timetables** • **Solve problems with frequency trees** • **Add and subtract numbers in standard form** • Apply the properties of multiplication and division • Apply and use factors and multiples • Multiply and divide integers and decimals by powers of 10 • Convert metric units • Apply formal methods for multiplication and division of integers and decimals • Solve problems using area of rectangles and parallelograms • Understand and use order of operations • Understand and solve problems using the area of triangles • Calculate area of compound shapes (including rectangles, triangles) • **Multiply by 0.1 and 0.01 (H)** • **Understand and solve problems using the area of trapezia** • **Solve problems using the mean** • **Explore multiplying and dividing in algebraic expressions**	• Use one or a series of function machines for a given numerical input (including negatives), to find the output • Use inverse operations to find the input, given the output of a single function machine • Use diagrams and letters to generalise number operations • Use diagrams and letters with single or a series of two function machines • Find the function machine given an expression • Substitute values into single and two-step operation expressions (including negatives) • Generate sequences using an algebraic rule • Represent one and two-step functions graphically • Understand the meaning of equality and equivalence • Understand and use fact families numerically and algebraically • Solve one and two-step equations +/-/x /÷ using inverse operations (including negatives and those with fraction solutions) • Simplify algebraic expressions by collecting like terms, using the ≡ sign • Describe and continue a sequence (diagrammatical and numerical) • Predict and check next terms in a sequence • Identify linear and non-linear sequences (including Fibonacci, geometric, triangular, square and cube numbers) • Continue linear sequences and non-linear sequences (including Fibonacci, arithmetic, geometric, triangular, square and cube numbers)	• Recognise, understand, compare, order and write any number up to one billion in words and figures • Work out intervals and position integers on a number line (including negatives) • Round to the nearest power of 10 • Compare two numbers using <, ≤, ≥.> • Order a list of integers • Find the range of a set of numbers • Find the median of a set of numbers • Truncate numbers (decimal places only) • Round decimals to the nearest 1 decimal place and numbers to 1 significant figure • **Round a number to 1, 2 & 3 significant figures.** • **Write 10, 100, 1000 etc. as powers of ten** • **Write positive integers in the form A x 10^n** • **Interpret negative powers of 10** • **Write decimals in the form A x 10^n** • Represent tenths and hundredths on a number line and in a diagram • Interchange/convert between fractional and decimal number lines • Convert between fractions and decimals – tenths and hundredths • Convert between fractions and decimals – fifths and quarters • Understand the meaning of percentage using a hundred square • Convert fluently between fractions, decimal and percentages • Use and interpret pie charts • Represent any fraction as a diagram or on a number line • Identify and use equivalent fractions

	• Understand and use representations of directed number • Order directed numbers (including use of number lines and inequality signs) • Perform calculations that cross over zero • +/- directed numbers • x/÷ directed numbers • Use a calculator to check calculations, including order of operations (including negative numbers) • **Evaluate algebraic expressions with directed number** • **Solve two-step equations** • **Use the roots of positive numbers** • **Identify higher powers and roots**	• Explain the term-to-term rule for a sequence • **Interpret and identify sequences in a table and graphically** • **Continue the next terms of non-linear and special sequences including quadratic and other sequences** • **Find missing terms in a sequence**	• Understand fractions as division • Convert between fractions and decimals – eighths and thousandths • Convert fluently between any fraction, decimal and percentage • **Interpret FDP conversions greater than 1 (H)**
Disciplinary Knowledge (**Bold is higher tier only)**	Select and apply the most appropriate mathematical method to solve problems, including those, by working with: • Integers and decimals (and inverse operations) • Mental and formal strategies for adding and subtracting integers • Perimeter • Bar charts and line charts • Standard units of time • **Financial maths problems** • **Tables and timetables** • **Frequency trees** • **Standard form** • Multiplication and division • Factors and multiples • Integers and decimals by powers of 10 • Metric units • Formal methods for multiplication and division of integers and decimals • Area of rectangles, triangles, parallelograms and compound shapes • Order of operations • **Multiply by 0.1 and 0.01 (H)** • **Area of trapezia** • **The mean** • **Algebraic expressions with directed number** • Directed number (including use of number lines and inequality signs)	Select and apply the most appropriate mathematical method to solve problems, including those, by working with: • Function machines for a given numerical input (including negatives), to find the output • Inverse operations to find the input, given the output of a single function machine • Diagrams and letters to generalise number operations • Diagrams and letters with single or a series of two function machines • Function machine to give an expression • Single and two-step operation expressions (including negatives) • Sequences using an algebraic rule • Equality and equivalence • Fact families numerically and algebraically • Solve one and two-step equations +/-/x /÷ graphically and using inverse operations (including negatives and those with fraction solutions) • Algebraic expressions by collecting like terms, using the ≡ sign • Sequences (diagrammatical and numerical) • Linear and non-linear sequences (including Fibonacci, geometric, triangular, square and cube numbers)	Select and apply the most appropriate mathematical method to solve problems, including those, by working with: • Any number up to one billion in words and figures • Intervals and position integers on a number line (including negatives) • Rounding to the nearest power of 10, 1 decimal place and numbers to 1 **(2 and 3)** significant figure • Comparing and ordering two numbers using <, ≤, ≥.> • The range of a set of numbers • The median of a set of numbers • Truncating numbers (decimal places only) • **Numbers such as 10, 100, 1000 etc. as powers of ten** • **Positive integers in the form A x 10^n** • **Negative powers of 10** • **Decimals in the form A x 10^n** • Tenths and hundredths on a number line and in a diagram • Fractional and decimal number lines, including tenths and hundredths, fifths and quarters • Percentage using a hundred square • Fractions, decimal and percentages • Pie charts • Equivalent fractions • Fractions as division

	• Calculations that cross over zero • Use a calculator to check calculations, including order of operations (including negative numbers) • **Two-step equations** • **Roots of positive numbers** • **Higher powers and roots**	• Linear and non-linear sequences (including Fibonacci, arithmetic, geometric, triangular, square and cube numbers) • Term-to-term rule for a sequence • **Sequences in a table and graphically** • **Continue the next terms of non-linear and special sequences including quadratic and other sequences** • **Find missing terms in a sequence**	• Fractions and decimals – eighths and thousandths • Fraction, decimal and percentage • **FDP conversions greater than 1 (H)**
Assessment (The methods that teachers will use to assess the progress of all students)	• Spring assessment consisting of one calculator and one non-calculator paper • Check In Tasks are completed the week prior to teaching each unit to assess retained knowledge and starting point. • Check Out Tasks are completed the week following teaching with a teacher-led feedback and improvement lesson following marking.	• Check In Tasks are completed the week prior to teaching to assess retained knowledge and starting point. • Check Out Tasks are completed the week following teaching with a teacher-led feedback and improvement lesson following marking.	• Summer assessment consisting of one calculator and one non-calculator paper • Check In Tasks are completed the week prior to teaching to assess retained knowledge and starting point. • Check Out Tasks are completed the week following teaching with a teacher-led feedback and improvement lesson following marking.
Reading, Writing and Vocabulary	The national curriculum for mathematics reflects the importance of spoken language in students' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. Students are assisted in making their thinking clear to themselves as well as others and explicit modelling is a key priority for classroom teaching. Teachers ensure that pupils build secure foundations by using discussion and whiteboard assessment to probe and remedy any misconceptions.		
	addition subtraction inverse operations perimeter bar/line chart hour minute second timetable frequency tree multiplication division powers area rectangle parallelogram triangle	positive negative zero / zero pair sum difference product order operations powers roots	function machine input output inverse operation term number letter variable expression substitute formula graph equation equality equivalent identity solve
	like unlike simplify collect expand bracket(s) factorise coefficient sequence numerical algebraic continue term triangular square cube arithmetic	place value number line integer decimal interval position round order compare truncate significant figure error interval estimate powers indices standard form	fraction decimal percentage tenths hundredths convert represent identify compare order division

	compound trapezium		term linear geometric non-linear rule	quadratic nth term table graph Fibonacci		
Numeracy	• As defined					
Personal Development	•		•		•	

	Half Term 4	**Half Term 5**	**Half Term 6**
Key Topics	Unit 9 Fractions & Percentages of Amounts Unit 10 Addition & Subtraction of Fractions Unit 11 Construct Measure & Use Geometric Notation	Unit 12 Develop Geometric Reasoning	Unit 13 Develop Number Sense Unit 14 Sets & Probability Unit 15 Prime Numbers & Proof
Substantive Knowledge **(Bold is higher tier only)**	• Find a simple fraction of an amount (include unit fractions and common fractions) • Use a given fraction to find the whole and/or other fractions • Find a % of an amount using mental methods • Find a % of an amount using a calculator • Solve problems with fractions / percentages >1 • Understand representations of fractions • Convert between mixed numbers and fractions • Add and subtract unit fractions with the same denominator • Add and subtract any fractions with the same denominator • Add and subtract fractions from integers (e.g. 1 – ¾) • Understand and use equivalent fractions (including ordering) • Add and subtract fractions where denominators have a simple common multiple (related fraction) • Add and subtract fractions with any denominator • Add and subtract improper fraction and mixed numbers	• Understand and use angles at a point • Understand & use angles at a point on a straight line • Understand & use vertically opposite angles • Understand & use the sum of angles in a triangle • Understand & use the sum of angles in a quadrilateral • Solve angle problems using properties of triangles and quadrilaterals • Solve complex angle problems, using a combination of triangle and quadrilateral properties • **Find and use the interior angle sum of any polygon (H)** • **Find exterior angles of a polygon (H)** • **Investigate angles on parallel lines (H)** • **Understand and use parallel line angle rules to solve problems: co-interior, alternate and corresponding angles (H)** • **Use known angle facts to obtain simple proof e.g. sum of angles in a triangle sum to 180 (H)**	• Use mental addition and subtraction strategies for integers • Use mental multiplication and division strategies for integers • Use factors to simplify calculations • Use estimation as a method for checking mental calculations • Use a mental strategy, formal written method or a calculator • Use mental addition and subtraction strategies for decimals • Use mental addition and subtraction strategies for fractions • Use known number facts to derive other facts • Use known algebraic facts to derive other facts • Use vocabulary of probability • Understand and use probability scale • Understand that the sum of probability of all possible outcomes is 1 • Calculate the probability of a single event • Generate sample spaces for single events • Identify and represent sets • Interpret and create basic Venn diagrams

	• Use equivalence to add and subtract fractions and decimals • Use fractions in algebraic contexts • **Add and subtract simple algebraic fractions (H)** • Understand and use letter and labelling including geometric figures • Draw and measure line segments • Understand angles as a measure of turn, link to compass points • Classify angles • Measure and draw angles up to 180 • Identify parallel and perpendicular lines • Identify polygons (up to decagon) • Recognise types of triangle • Recognise types of quadrilateral • Construct triangles SSS • Draw and measure angles up to 360, including 180-360. • Construct triangles, SSS, SAS, ASA • Interpret simple Pie Charts using proportion • Interpret pie charts using a protractor • Draw Pie Chart • **Construct more complex polygons** • **Solve problems with pie charts**		• Understand and use the intersection of sets • Understand and use union of sets • **Understand and use complements in a set (H)** • (Y8 WR SOL) • Find probability from Venn Diagrams • Understand and use two-way tables to find probability • Understand and use sample space diagrams to find probability • Find and use multiples • Identify factors of numbers • Recognise and identify prime numbers • Recognise and identify square, cube and triangular numbers • Understand and use BIDMAS (indices up to squared and cubed) • Identify factors of expressions • Find common factors of a set of numbers including HCF • Find common multiples of a set of numbers including LCM • Write a number as a product of prime factors • Higher powers and roots • Use a Venn diagram to find HCF/LCM • Identify factors of a number from the product of primes • Identify whether a number is square from its product of prime factors • Make and test conjectures • Use counter examples to disprove a conjecture
Disciplinary Knowledge (**Bold is higher tier only)**	Select and apply the most appropriate mathematical method to solve problems, including those, by working with: • Simple fraction of an amount (include unit fractions and common fractions) • A given fraction to find the whole and/or other fractions • Percentage of an amount using mental methods and using a calculator • Fractions / percentages >1	Select and apply the most appropriate mathematical method to solve problems, including those, by working with: • Angles at a point and on a straight line • Vertically opposite angles, sum of angles in a triangle, the sum of angles in a quadrilateral • Properties of triangles and quadrilaterals • Angle problems, using a combination of triangle and quadrilateral properties • **Interior angle sum of any polygon (H)**	Select and apply the most appropriate mathematical method to solve problems, including those, by working with: • Mental addition and subtraction strategies for integers • Mental multiplication and division strategies for integers • Factors to simplify calculations • Estimation as a method for checking mental calculations

	• Representations of fractions • Mixed numbers and fraction conversion • Unit fraction calculations with the same or different denominator and when ordering or comparing • Improper fraction and mixed numbers • Fractions and decimals • Fractions in algebraic contexts • **Simple algebraic fraction calculations (H)** • Letter and labelling including geometric figures • Line segments • Angles as a measure of turn, link to compass points and classify • Angles up to 180 and 360 • Parallel and perpendicular lines • Polygons • Types of triangle, quadrilateral • Triangles, SSS, SAS, ASA • Pie Charts using proportion	• **Exterior angles of a polygon (H)** • **Angles on parallel lines (H)**, including **co-interior, alternate and corresponding angles (H)** • **Simple proof e.g. sum of angles in a triangle sum to 180 (H)**	• Formal written method or a calculator • Mental addition and subtraction strategies for decimals • Mental addition and subtraction strategies for fractions • Number facts to derive other facts • Algebraic facts to derive other facts • Vocabulary of probability • Probability scale • Probability of all possible outcomes is 1 • Probability of a single event • Sample spaces for single events • Notation for sets • Venn diagrams including the intersection of sets, the union of sets and the **complements in a set (H)** • Two-way tables and sample space diagrams to find probability • Multiples, Factors and Primes Numbers • Square, cube and triangular numbers • BIDMAS (indices up to squared and cubed) • Factors of expressions • Common factors of a set of numbers including HCF • Common multiples of a set of numbers including LCM • Product of prime factors • Higher powers and roots • Venn diagram to find HCF/LCM • Factors of a number from the product of primes • Square numbers from its product of prime factors • Conjectures • Proof and counter examples to disprove a conjecture
Assessment (The methods that teachers will use to assess the progress	• Spring assessment consisting of one calculator and one non-calculator paper • Check In Tasks are completed the week prior to teaching each unit to assess retained knowledge and starting point. • Check Out Tasks are completed the week following teaching with a teacher-led feedback and improvement lesson following marking.	• Check In Tasks are completed the week prior to teaching to assess retained knowledge and starting point. • Check Out Tasks are completed the week following teaching with a teacher-led feedback and improvement lesson following marking.	• Summer assessment consisting of one calculator and one non-calculator paper • Check In Tasks are completed the week prior to teaching to assess retained knowledge and starting point. • Check Out Tasks are completed the week following teaching with a teacher-led feedback and improvement lesson following marking.

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	fraction numerator denominator whole percentage decimal multiplier increase decrease integer fraction numerator denominator equivalent common multiple proper improper mixed numbers reciprocal algebraic fraction line segment	angle compass parallel perpendicular triangle equilateral isosceles scalene quadrilateral square rectangle rhombus parallelogram trapezium kite delta pentagon hexagon heptagon octagon nonagon decagon construct pie charts	angles at a point angles on a straight line vertically opposite angles angles in a triangle angles in a quadrilateral alternate angles corresponding angles Co-interior angles polygon interior exterior parallel		probability likely unlikely certain impossible Venn diagram outcome event set element intersection union sample space complement two-way table frequency tree	factors multiples prime square cube triangular indices common factors highest common factor lowest common multiple product of prime factors Venn diagram conjecture counterexample disprove
Numeracy	• As defined					
Personal Development	•		•		•	