DMS Curriculum Plan

SUBJECT: Maths

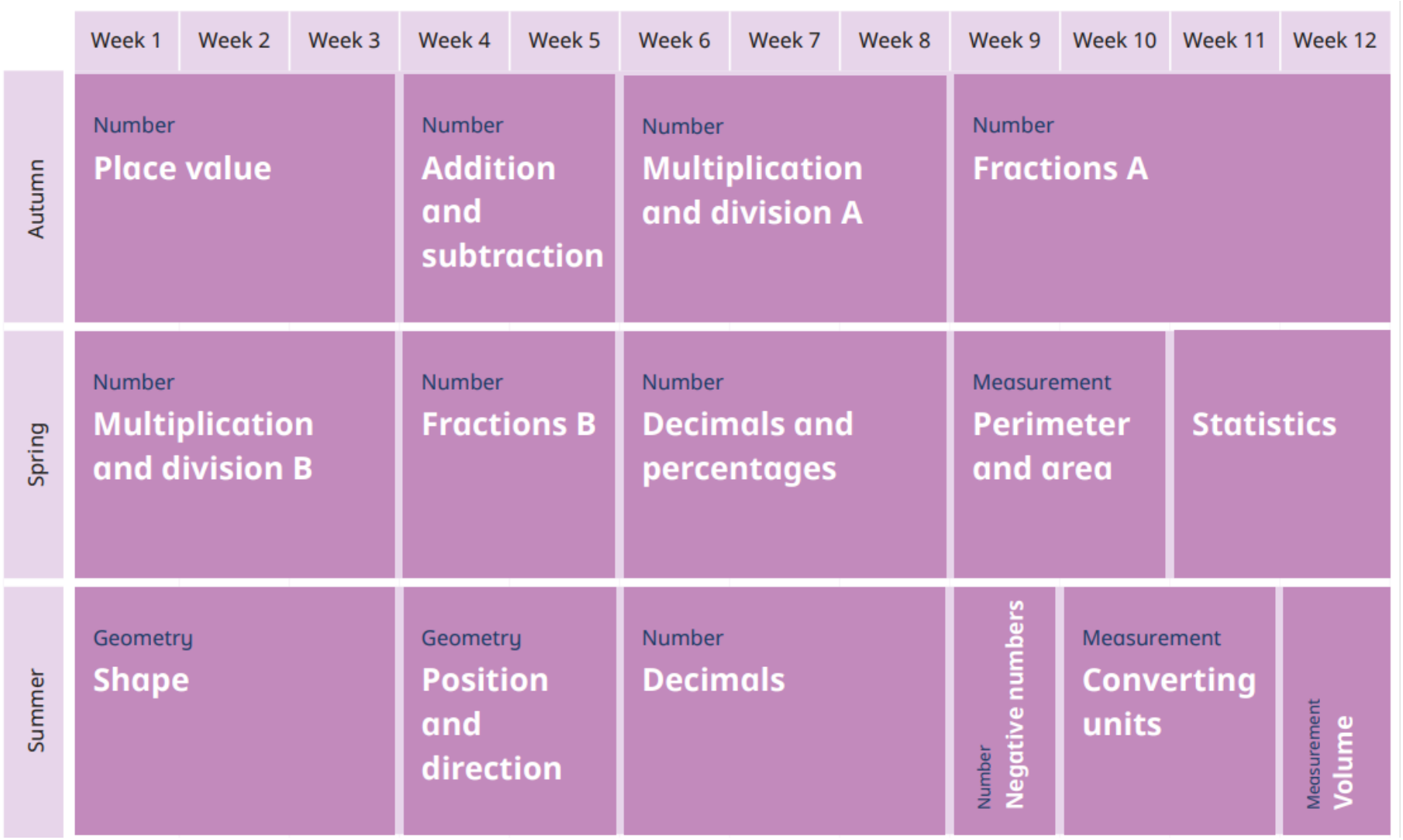
At Dorchester Middle School, as part of our planning in maths we ensure that pupils can remember more and learn more by weaving knowledge and skills throughout units of learning so that children have time to practise, discuss, reflect and revisit what they have been taught. We carefully follow the National Curriculum and ensure learning is progressive and sequential, giving pupils the opportunity to build on and apply previous knowledge in all units before developing further skills in this subject.

The national curriculum for mathematics aims to ensure that all pupils:

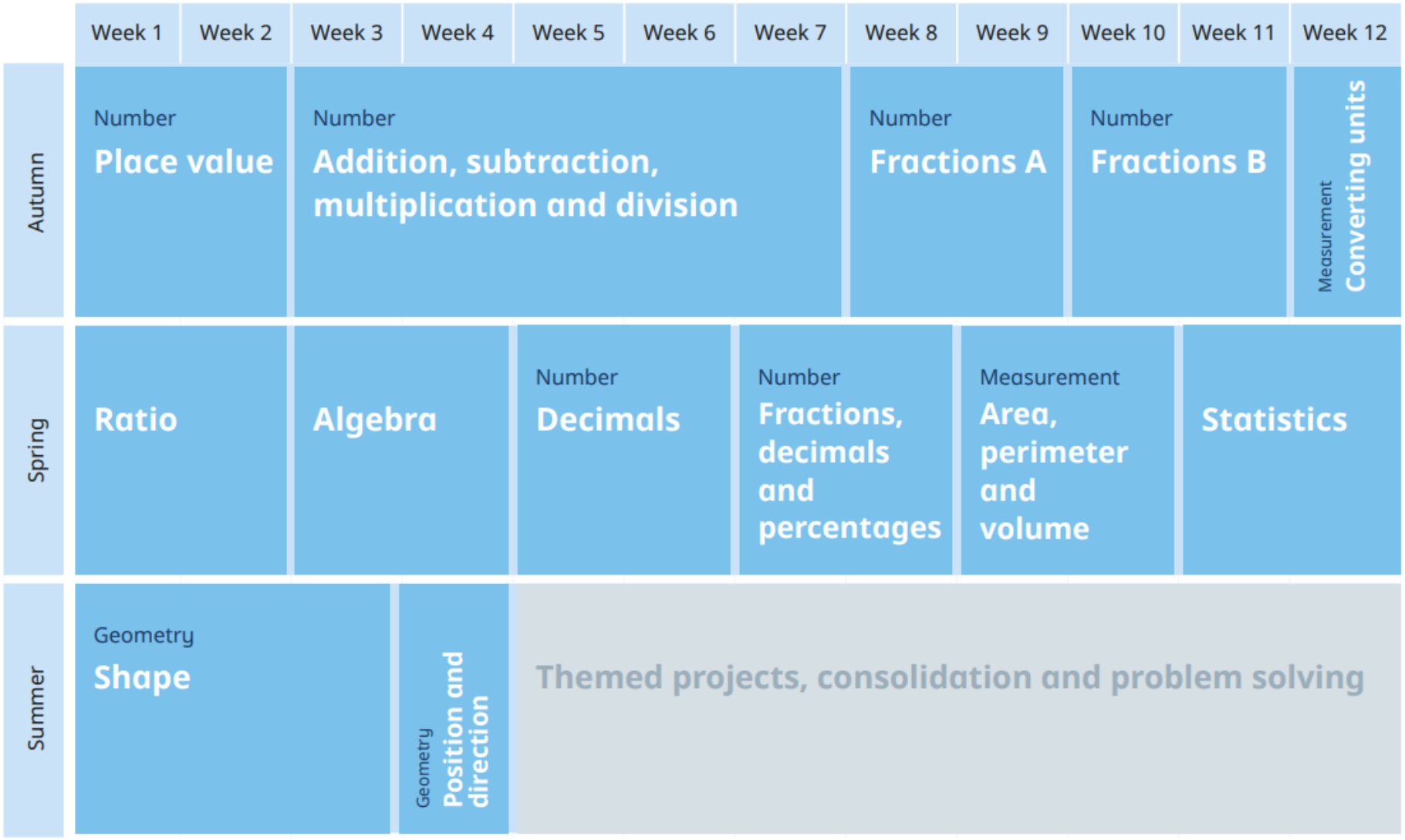
- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress will be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material will consolidate their understanding, including through additional practice and in-class intervention.

Year 5 Topic Overview

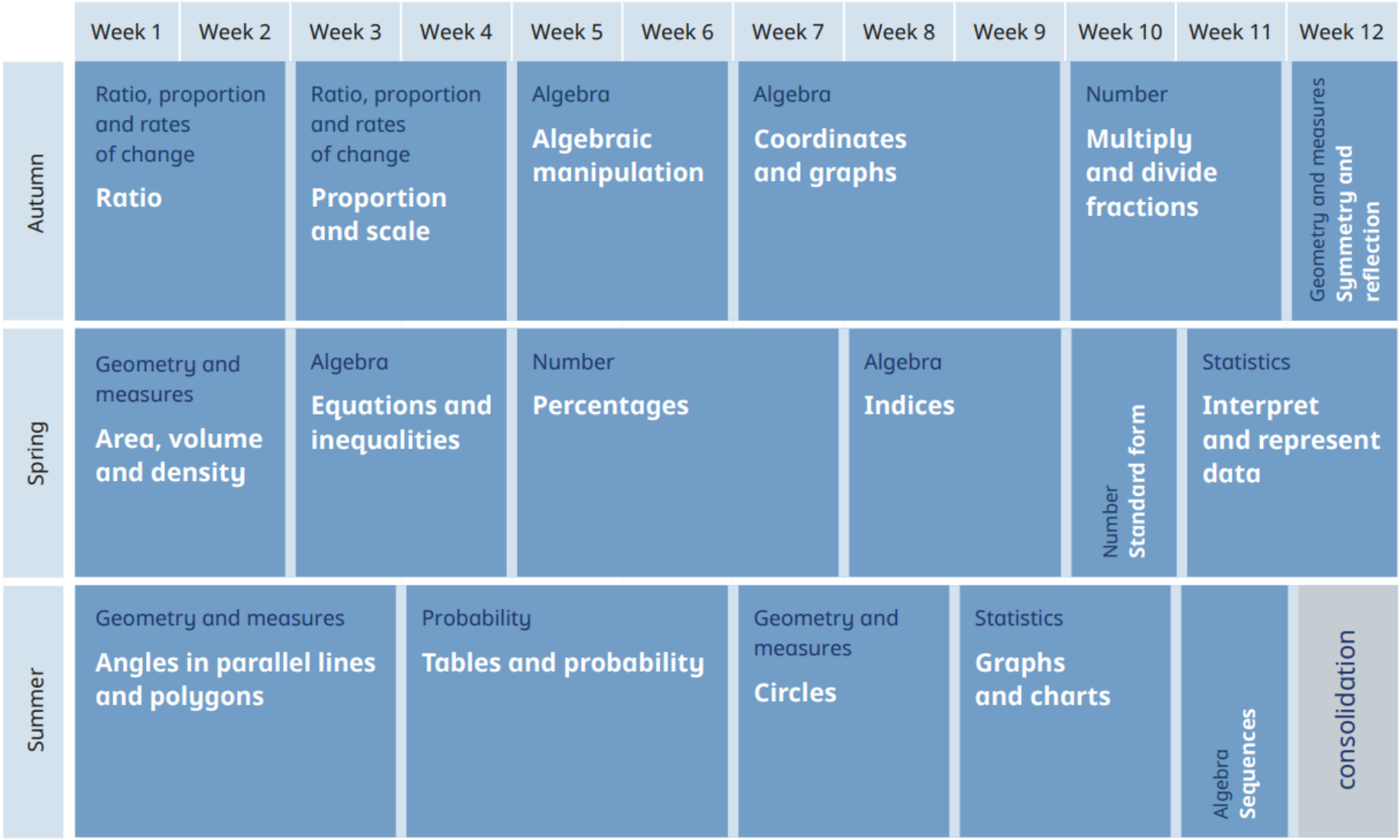


Year 6 Topic Overview



Year 7 Topic Overview

Year 8 Topic Overview



TERM	Year 5	Year 6	Year 7	Year 8
T1 KNOWLEDGE	**Number and place value.** Pupils will know ● How to read and write Roman numerals ● The value of each digit in a number to 1,000,000 ● How to use inverse functions to check calculations **Addition and subtraction.** Pupils will know ● What the concepts of addition and subtraction are used foy ● How to use bar models, number lines and part whole models to represent addition and subtraction calculations	**Number and place value.** Pupils will know ● The value of each digit in a number to 10,000,000 **Four operations** Pupils will know ● The meaning of each of the four operations ● Which operation and methods they should use when calculating and why ● How to identify common factors, common multiples and prime numbers ● Divisibility rules ● Square and cube numbers ● Order of operations (BIDMAS)	● **Sequences:** Pupils will know ● What is meant by a sequence ● What a linear and non-linear sequence look like ● How to find term-to-term rules **Algebraic notation and substitution:** Pupils will know ● How to use function machines ● That a letter can be used to represent numbers **Expressions and equations:** Pupils will know ● The equivalence of algebraic expressions ● Unlike and like terms ● What solving an equation means.	**Ratio** Pupils will know ● What a ratio represents and its links to multiplication and division, as well as how ratio relates to fractions ● How to reduce a ratio to its simplest form and divide a given quantity into two parts ● The link between ratio and fractions **Proportion and scale** Pupils will know ● What direct proportion is and how it can be used in different contexts, such as currency conversions, metric and imperial measures conversions ● How things can be drawn to scale using a scale factor to enlarge or a fractional scale factor to reduce the size. ● How to recognise similar shapes and understand map scales **Algebraic manipulation** Pupils will know ● Algebraic terms: expression, equation, identity, formula, inequality, term, factor, variable, function, solution, substitute, factorise and expand.

T1 SKILLS	**Number and place value.** Pupils will be able to ● Read, write, order and compare numbers to 1,000,000 ● Round numbers to the nearest 10, 100, 1000, 10,000, 100,000 **Addition and subtraction.** Pupils will be able to ● Add and subtract numbers mentally ● Add and subtract numbers using formal written methods ● Solve multi-step problems in context	**Number and place value.** Pupils will be able to ● Read, write, order and compare numbers to 10,000,000 ● Round any number to the required degree of accuracy ● Use negative numbers in context and calculate intervals across zero **Four operations** Pupils will be able to ● Solve multi-step problems involving the four operations ● Multiply and divide numbers up to a 4 digit number by a 2 digit number using formal written methods ● Perform mental calculations efficiently, including those requiring knowledge of square and cube numbers, brackets and the order of operations	**Sequences:** Pupils will be able to ● Describe, continue and generate sequences using shapes, diagrams, rules and numbers. **Algebraic notation and substitution:** Pupils will be able to ● Substitute numbers for letters ● Find inputs and outputs for one and two step function machines using numbers and algebraic expressions **Expressions and equations:** Pupils will be able to ● Collect like terms in algebraic expressions ● Use fact families and single and double function machines (with inverse functions) to solve one and two step equations.	**Ratio** Pupils will be able to ● Use ratio notation, and write ratios in their simplest form ● Solve problems and express in the form 1:n or n:1 ● Share a quantity into a given ratio ● Link ratio to fractions of an amount ● Solve problems involving ratio ● Understand how ratio tables show relationships between the numbers **Proportion and scale** Pupils will be able to ● Solve problems involving direct proportion ● Draw, interpret and use conversion graphs for speed, distance, time and currency ● Use double number lines to represent proportional relationships ● Calculate distances on maps and lengths on scale diagrams **Algebraic manipulation** Pupils will be able to ● Form and simplify algebraic expressions ● Add and subtract like terms to simplify expressions ● Use directed number with algebra ● Substitute values in expressions ● Expand brackets and factorise expressions

T2 KNOWLEDGE	**Multiplication and division** Pupils will know ● How to identify multiples and factor pairs of a number and be able to identify common factors of two numbers ● What a prime number is, as well as prime factors and composite numbers ● Square and cube numbers and their notation **Fractions** Pupils will know ● What a fraction is and how it is written ● How to identify, name and write equivalent fractions ● What mixed numbers are improper fractions are	**Fractions** Pupils will know ● That fractions can be represented in different ways, including pictorially and on a number line ● What simplest form and equivalent fractions are ● What effect multiplying by a fraction has and how this can be shown visually ● What it means to divide a fraction by an integer and how this can be shown visually **Converting units** Pupils will know ● Metric units of measure for length, mass, volume and time and how to convert between them ● How to convert between miles and kilometres ● Some of the imperial units of mass, capacity and length	**Place Value, ordering and rounding:** Pupils will know ● How to read and write numbers to a billion and use decimal place value to thousandths. ● How to round, compare and order numbers. ● The difference between rounding to decimal places and significant figures **Four operations** Pupils will know • The effects of multiplying and dividing numbers by decimals • The order of operations **Averages and range** Pupils will know • The different measures of average (mean, mode, median) and range	**Coordinates and graphs** Pupils will know ● How to plot coordinates in all four quadrants ● How to label lines parallel to the axes ● How a straight line can be denoted by an equation ● What gradient and intercept mean (y=mx+c) ● That linear sequences can be represented by a straight line in a graph, and equation of this line is linked to the nth term of the sequence **Multiply and divide fractions** Pupils will know ● How to add and subtract fractions (revision) ● How to multiply and divide fractions by an integer and another fraction ● What the reciprocal is and how to use it **Symmetry and reflection** Pupils will know ● How to recognise line symmetry in polygons ● Understand rotational symmetry

T2 SKILLS	**Multiplication and division** Pupils will be able to ● Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 **Fractions** Pupils will be able to ● Convert between mixed numbers and improper fractions. ● Compare and order fractions with denominators that are multiples of the same number ● Add and subtract fractions with the same denominators and denominators that are multiples of the same number	**Fractions** Pupils will be able to ● Use common factors to simplify fractions ● Compare and order fractions using a number line ● Add and subtract fractions with different denominators, including mixed numbers ● Solve problems involving adding and subtracting fractions and mixed numbers ● Multiply fractions by integers and other fractions ● Divide fractions by an integer ● Find fractions of amounts ● Find the whole when given a fractional amount **Converting units** Pupils will be able to ● Solve problems involving metric measures ● Use number lines to convert between metric and imperial units of measure	**Place Value, ordering and rounding:** Pupils will be able to ● Read and write large numbers and those to three decimal places. ● Use number lines to compare, order and round whole and decimal numbers. ● Estimate answers to calculations and round to 2 significant figures **Four operations** Pupils will be able to ● Use the four operations to calculate with integers and decimals ● Use the order of operations **Averages and range** Pupils will be able to ● Calculate the mean, mode, median and range of a set of numbers ● Choose the best average to represent a set of data	**Coordinates and graphs** Pupils will be able to ● Recognise, name and plot straight line graphs parallel to the x or y axis ● Plot the graphs of linear functions ● Calculate gradients and intercepts of linear functions and write in the form y=mx+c ● Find the midpoint of a line **Multiply and divide fractions** Pupils will be able to ● Use the four operations with fractions and mixed numbers ● Understand and use reciprocals ● Solve problems involving fractions, including simple algebraic fractions **Symmetry and reflection** Pupils will be able to ● Reflect a shape in horizontal, vertical and diagonal lines ● Reflect a shape given the equation of the line ● Describe a reflection ● Rotate shapes and describe the rotation
SUMMATIVE ASSESSMENT 1	● Tables test ● Arithmetic assessment	● Tables test ● Full SATs papers	In addition to end of topic short tests, pupils will take an end of term test on the topics taught this term.	In addition to end of topic short tests, pupils will take an end of term test on the topics taught this term.

T3 KNOWLEDGE	**Multiplication and division** Pupils will know ● What multiplication and division mean and how they can be represented diagrammatically. ● Multiplication facts to 10 x 10 and the associated division facts ● How the remainder in a division calculation can be interpreted according to context **Fractions** Pupils will know ● What multiplication and division mean in the context of fractions	**Ratio and proportion** Pupils will know ● The language and symbol used when exploring ratio ● What similar shapes are and how scale factors are used in scale drawing ● How multiplication and division facts are used when solving ratio and proportion problems **Decimals** Pupils will know ● The value of each digit in numbers given to 3 decimal places ● Simple fraction and decimal equivalents (½, ¼, ¾, ⅕, ⅖, ⅗, ⅘ as well as tenths and hundredths)	**Graphing data** Pupils will know ● When to use different bar charts, such as dual and composite charts ● When to use scatter graphs and line graphs to represent data ● What a linear and non-linear relationship looks like in a graph **Fraction, decimal and percentage equivalence** Pupils will know ● What fractions, decimals and percentages are and how they are represented. ● The equivalence of fractions, decimals and percentages.	**Area, volume and density** Pupils will know ● The names of 2D and 3D shapes ● The formulae for finding the areas of 2D shapes ● What a prism is and how to calculate the volume ● Metric measure conversions ● Know what mass, volume and density are and how they are linked **Equations and inequalities** Pupils will know ● What it means to solve an equation or inequality **Percentages** Pupils will know ● Common fraction, decimal and percentage equivalence ● How to represent equivalent fractions, decimals and percentages on number lines ● What fraction and percentage increase and decrease means

T3 SKILLS	**Multiplication and division** Pupils will be able to use formal written methods to ● Multiply a 4 digit number by 1 digit ● Multiply 2 and 3 digit numbers by a 2 digit number (long multiplication) ● Divide a 4 digit number by 1 digit (short division) ● Divide using remainders ● Solve problems using multiplication and division **Fractions** Pupils will be able to ● Multiply fractions and mixed numbers by whole numbers, supported by materials and diagrams ● Find fractions of amounts ● Find the whole given a fraction amount	**Ratio and proportion** Pupils will be able to ● Solve problems involving sharing in a ratio ● Solve problems involving similar shapes where the scale factor is known or could be found ● Solve problems involving ratio and proportion using known multiplication and division facts **Decimals** Pupils will be able to ● Order and round numbers to to 3 decimal places ● Multiply and divide decimals by 10, 100, 1000 ● Add and subtract decimals ● Multiply and divide decimals by integers ● Associate a fraction with division and calculate decimal fraction equivalents for simple fractions	**Graphing data** Pupils will be able to ● Plot and interpret bar charts, including dual and composite charts ● Plot and interpret scatter graphs ● Plot and read line graphs **Fraction, decimal and percentage equivalence** Pupils will be able to ● Convert between fractions and decimals and percentages for tenths, fifths, halves, quarters and eighths.	**Area, volume and density** Pupils will be able to ● Convert between metric measures (length, area and volume) ● Calculate the areas of 2D shapes and compound shapes ● Calculate the volume of cubes, cuboids and prisms ● Solving problems involving mass, volume and density **Equations and inequalities** Pupils will be able to ● Form and solve one and two step equations, including those involving fractions and brackets, and those with unknowns on both sides ● Form and solve simple inequalities ● Solve equations in the context of shapes **Percentages** Pupils will be able to ● Convert between fractions, decimals and percentages ● Find fractions and percentages of amounts using mental methods and calculators ● Calculate percentage increase and decrease using a multiplier ● Express one number as a fraction and percentage of another ● Find the original amount when given a fraction or percentage of that amount ● Solve problems involving percentage change

T4 KNOWLEDGE	**Decimals and percentages** Pupils will know ● How to write numbers to decimals places and know what each digit represents ● Equivalent fractions and decimals - tenths, hundredths and thousandths ● What a percentage is, how it is written and how is relates to fractions and decimals **Perimeter and area** Pupils will know ● What perimeter and area mean and the units they are measured in **Graphs and tables** Pupils will know ● How information can be represented in and interpreted from different graphs and tables.	**Percentages** Pupils will know ● Simple fraction, decimal and percentage equivalence **Perimeter, area and volume** Pupils will know ● The difference between perimeter and area and the units they are both measured in ● Recognise that shapes with the same area can have different perimeters and vice versa ● The formulae for finding the areas of rectangles, squares, triangles and parallelograms ● The units used to measure perimeter, area and volume ● The formula for finding the volume of a cube and a cuboid	**Directed number** Pupils will know ● What negative numbers are and how to calculate with them **Fractions and percentages of amounts** Pupils will know ● How to find simple fractions and percentages of amounts with and without using a calculator ● How to find percentage increase and decrease **Perimeter and area** Pupils will know ● The metric units of length ● That perimeter is the distance around a shape (total length) ● That area is the surface of a shape measured in squares	**Indices and standard form** Pupils will know ● What an index is and how numbers and algebraic expressions can be written as products of themselves using index notation ● What the index laws are (through exploration) ● What standard form is and how it can be used ● What standard form looks like on a calculator **Interpret and represent data** Pupils will know ● About different types of data ● The different types of average and know what the range shows ● The names and functions of different graphs and tables ● The difference between grouped and ungrouped data

T4 SKILLS	**Decimals and percentages** Pupils will be able to ● Read, write, order and compare numbers with up to 3 decimal places ● Read and write decimal numbers as fractions ● Round to the nearest whole number and to 1 decimal place ● Convert between equivalent percentages, decimals and fractions **Perimeter and area** Pupils will be able to ● Measure and calculate the perimeter of rectalinear shapes ● Calculate the area of rectangles and compound shapes **Graphs and tables** Pupils will be able to ● Read, interpret and complete line graphs, two-way tables and timetables and solve problems related to them.	**Percentages** Pupils will be able to ● Recall simple fraction, decimal, % equivalence ● FInd simple percentages of an amount using a double number line and from finding 10% and 1% **Perimeter, area and volume** Pupils will be able to ● Calculate the areas of rectangles and of triangles enclosed by rectangles ● Calculate the area of any triangle and of a parallelogram ● Solve problems involving area and perimeter ● Calculate and compare volumes of cubes and cuboids	**Directed number** Pupils will be able to ● Order directed numbers and solve problems with them ● Use the four operations with directed number ● Use the order of operations rule **Fractions and percentages of amounts** Pupils will be able to ● Calculate fractions and percentages of amounts with and without using a calculator ● Solve problems using fractions and percentages of amounts ● Find the whole from a fraction or percentage amount **Perimeter and area** Pupils will be able to ● Convert metric units of length ● Calculate the perimeter of a polygon and compound shape ● Find the area of a rectangle, parallelogram, triangle and trapezium ● Solve problems involving perimeter and area	**Indices and standard form** Pupils will be able to ● Add and subtract expressions with indices ● Multiply and divide expressions with indices ● Use index notation ● Explore the index laws to simplify expressions ● Use standard form to record positive and negative powers of 10 **Interpret and represent data** Pupils will be able to ● Choose the most appropriate type of average ● Compare distributions using the average and the range ● Interpret frequency tables ● Draw graphs using grouped and ungrouped data
SUMMATIVE ASSESSMENT 2	● Modified SATs papers ● Tables test	● Full SATS papers	In addition to end of topic short tests, pupils will take an end of term test on the topics taught this term.	In addition to end of topic short tests, pupils will take an end of term test on the topics taught this term.

T5 KNOWLEDGE	**Properties of shape** Pupils will know ● The names given to different angles and that angles are measure in degrees ● That angles at a point add to 360° and angles on straight line add to 180° ● The names and properties of 2D and 3D shapes **Position and direction** Pupils will know ● How to read and plot coordinates in the first quadrant ● What is means to translate and to reflect a shape **Decimals** Pupils will know ● How decimals numbers are composed and what happens when decimals are multiplied and divided by 10 and 100	**Statistics** Pupils will know ● That line graphs, bar charts and pie charts show different information. ● What the mean average is and how is can be used **Properties of shape** Pupils will know ● How to draw, measure and classify angles ● The different names and properties of triangles ● The angle rules for vertically opposite angles, angles in a triangle, angles in a quadrilateral and angles in any polygon ● That radius, diameter and circumference are parts of a circle ● The names of 3D shapes and be able to describe them in terms of faces, edges and vertices **Position and direction** Pupils will know ● How to read and plot points in all four quadrants ● What is means to translate and to reflect a shape and how the coordinates change as a result	**Speed, distance and time** Pupils will know ● The different units of time from milliseconds to years ● How to read tables and timetables ● The relationship between speed, distance and time ● How to read distance time graphs **Properties of number** Pupils will know ● Factors, multiples and prime numbers ● Square, cube and triangular numbers ● Powers and roots	**Angles in parallel lines and polygons** Pupils will know ● The basic angle rules ● How to identify angles and lines using geometric notation ● What parallel lines are and the angles that are formed by a transversal ● About interior and exterior angles in polygons **Tables and probability** Pupils will know ● The language of probability and that probability can also be represented on a scale ● Probability can be written as a fraction or percentage ● That the sum of probabilities of and event is 1 ● What a sample space diagram, Venn diagram, frequency tree and two-way table show

T5 SKILLS	**Properties of shape** Pupils will be able to ● Use a protractor to measure and to draw angles ● Calculate angles at a point and on a straight line ● Relate angles to fractions of a turn ● Use the properties of 2D to solve problems involving missing lengths and angles ● Identify 3D shapes from 2D representations **Position and direction** Pupils will be able to ● Use coordinates to represent the position of a shape after a translation or after a reflection in horizontal and vertical lines **Decimals** Pupils will be able to ● Add and subtract decimals with a different number of decimal places ● Multiply and divide decimals by 10, 100 and 1000 ● Solve problems involving decimals	**Statistics** Pupils will be able to ● Interpret and complete line graphs, bar charts and pie charts ● How to calculate and interpret the mean as an average **Properties of shape** Pupils will be able to ● Measure and draw angles accurately ● Use angle rules for vertically opposite angles, angles in a triangle, angles in a quadrilateral and angles in any polygon to find missing angles ● Draw 2D shapes accurately, given lengths and angles ● Recognise and describe 3D shapes and their nets **Position and direction** Pupils will be able to ● Solve problems involving coordinates and missing vertices on the grid ● Translate shapes on a coordinate plane and reflect them in the axes and in diagonal lines	**Speed, distance and time** Pupils will be able to ● To convert between the different units of time ● Interpret tables and timetables ● Solve problems involving time and the calendar ● Calculate speed, time and distance ● Draw and interpret distance-time graphs ● Calculate speed from a graph **Properties of number** Pupils will be able to ● Find multiples and the lowest common multiple ● Find factors and the highest common factor ● Write numbers as a product of prime factors ● Recognise prime, square and triangular numbers ● Find powers, square roots and cube roots ● Find HCF and LCM from a Venn diagram ● Use factors to simplify calculations	**Angles in parallel lines and polygons** Pupils will be able to ● Recognise types of angles, use a protractor to measure and draw angles accurately ● Be able to calculate missing angles on a straight line, around a point and in triangles and quadrilaterals ● Identify and find missing angles in parallel lines ● Calculate exterior and interior angles of polygons ● Solve problems involving angles **Tables and probability** Pupils will be able to ● Identify possible outcomes and calculate the probability of an event occurring ● Find probabilities using sample space diagrams, frequency trees, two-way tables and Venn diagrams ● Solve problems involving probability and use diagrams to display information and make sense of it

T6 KNOWLEDGE	**Negative numbers** Pupils will know ● What a negative number is and where they can be seen in context **Converting units** Pupils will know ● Metric units within the context of mass, length and capacity ● The names of common imperial units of measure ● How to tell the time using analogue and digital clocks and how to read a timetable ● The value of coins and notes in our monetary system **Volume** Pupils will know ● The meaning of volume and capacity	**Calculator skills** Pupils will know ● How to use a scientific calculator **Presentation** Pupils will know ● How to present multi step problems **Problem solving** Pupils will know ● The skills needed to solve multi-step problems using different contexts and across topics ● They will know about financial aspects of maths, including salaries, calculating tax, interest, saving for deposit on a house, mortgage rates and budgeting for household bills.	**Add and subtract fractions** Pupils will know ● Representations of fractions ● Mixed numbers and improper fraction equivalence ● Fraction and decimal equivalents **Angles and polygons** Pupils will know ● The names of the different angles ● The sum of the angles at a point, on a straight line and vertically opposite ● The names of polygons ● About the size of the angles in the different types of triangles and in quadrilaterals	**Circles** Pupils will know ● The names of the parts of a circle ● How pi can be derived through measurement and its value as a decimal ● The formula for finding the circumference and the area of the circle given the radius or diameter **Graphs and charts** Pupils will know ● About the different types of graph and chart – bar, pictogram, line, scatter, pie ● Which type of graph is most appropriate for a particular dataset ● How to identify misleading graphs **Sequences** Pupils will know ● What a sequence of square, cube, triangular and Fibonacci numbers look like and how they are formed ● How to recognise a linear arithmetic sequence and a geometric sequence ● What the nth term means and how it can be useful
T6 SKILLS	**Negative numbers** Pupils will be able to ● Interpret, count, compare and order negative numbers	**Calculator skills** Pupils will be able to ● Use a calculator to interpret decimal places and solve problems **Presentation skills**	**Add and subtract fractions** Pupils will be able to ● Simplify fractions ● Convert between mixed numbers and improper fractions	**Circles** Pupils will be able to ● Calculate the circumference and area of a circle and fractions of a circle ● Solve problems involving perimeter and area, including those with parts of a circle and compound shape

	• Find the difference between numbers involving negatives **Converting units** Pupils will be able to • Convert between units of metric measure within the context of mass, length and capacity • Convert between units of time • Solve problems involving measure, including money and using decimal notation **Volume** Pupils will be able to • Estimate, compare and calculate volume and capacity	Pupils will be able to • Show their working clearly using words and diagrams so that others can see and follow the steps taken **Problem solving – Bakery topic** Pupils will be able to • Solve problems with area, perimeter and volume • Use ratio and proportion to scale recipes • Solve problems involving time in the context of baking • Design and make a net for a product **Problem solving – Tours topic** Pupils will be able to • Solve problems involving currency exchange, money and time in the context of holiday planning **Problem solving - Finance** Pupils will be able to • Solve problems involving percentages, area and perimeter, fractions and money	• Add and subtract fractions with different denominators • Add and subtract improper fractions and mixed numbers • Interchange between equivalent fractions and decimals when calculating and solving problems. • Add and subtract simple algebraic fractions **Angles and polygons** Pupils will be able to • Use the angle rules explored in year 6 (angles at a point, vertically opposite, along a straight line and in a triangle) to solve increasingly complex missing angle puzzles • Identify and draw parallel and perpendicular lines • Calculate missing angles in triangles and quadrilaterals	**Graphs and charts** Pupils will be able to • Read and interpret line graphs, bar charts, pictograms and pie charts • Construct statistical bar charts including dual and multiple bar charts. • Construct pie charts • Moved to Yr 7 for 2025 - Draw and interpret scatter graphs, • Moved to Yr 7 for 2025 - Draw a line of best fit and use it to determine correlation • Compare distributions using graphs and charts • Explain why some graphs can be misleading **Sequences** Pupils will be able to • Find patterns and describe rules in sequences • Continue and describe special sequences (square, cube, arithmetic, geometric) • Generate terms of sequence by using a position to term rule • Find and use the nth term of an arithmetic sequence • Recognise and continue non-linear sequences
SUMMATIVE ASSESSMENT 3	Full SATS papers	SATS (externally marked)	In addition to end of topic short tests, pupils will take an end of term test on the topics taught this term.	In addition to end of topic short tests, pupils will take an end of term test on the topics taught this term and they will take an arithmetic test (Middle School set)