Maths Curriculum Map – Year 6

Year 6 Autumn	
Number & Place Value	Solve number and practical problems involving: • Read, write, order, and compare numbers to at least 10,000,000 and determine the value of each digit. • Identify, represent, and estimate numbers using different representations including number-lines • Round any whole number to a required degree of accuracy (represent on a number line)
Addition and Subtraction with length and missing number equations	Add and subtract whole numbers with more than 4 digits. Represent solutions appropriately using informal and formal written methods. • Perform mental calculations, including with mixed operations and large numbers • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why. • Measure and calculate the perimeter of composite rectilinear shapes in cm and m. • Recognise with the same areas can have different perimeters and vice versa • Use knowledge of the order of op
Multiplication and division with missing number equations	Represent multiplication and division facts as grid arrays, link to rectangular areas, identifying factors as whole number side lengths of rectangles. • Calculate and compare the area of rectangles, including squares, and including using standard units (cm^2 and m^2) and estimate the area of irregular shapes. • Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers. Know and use the vocabulary of prime numbers. • Use place value knowledge to multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. • Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using a formal written method of long multiplication (see NC appendix for methods). • Divide numbers up to 4-digits by a 2-digit whole number using a formal written method of long division (see NC appendix for methods) , and interpret remainders as a whole number, fraction or by rounding as appropriate for the context. • Understand division as grouping, moving on from sharing, to make efficient use of multiplication facts when dividing. • Represent division calculations (not the solution) as number-lines and barmodels to support conceptual understanding before solving. • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
Fractions and equivalence	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

	• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Compare and order fractions, including fractions larger than one.
Percentages	Use place value knowledge to find 10% and 1% of any number. • Know that 50% is the same as finding one half, 25% is the same as finding one quarter and 75% is the same as finding three quarters of a quantity (or shape) • Solve problems involving the calculation of percentages, e.g. 15% of 360 and the use of percentages for comparison.
Measurement (time)	Complete, read and interpret information in tables, including time tables • Solve problems involving converting between units of time. • Solve problems involving durations of time and fractions of time e.g. 2/3 of a day in hours
Geometry (shape angle, and parts of circle)	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. • Draw 2-D shapes using given dimensions and angles • Recognise, describe, and build simple 3-D shapes, including making nets. • Know angles are measured in degrees: estimate and compare acute, obtuse, and reflex angles • Identify angles where they meet at a point, on a straight line or are vertically opposite and find missing angles. • Describe positions on the full coordinate grid (all four quadrants) (link to negative numbers on a number-line). • Draw and translate simple shapes in the coordinate plane and reflect them in the axes
NPV with measurement (mass and capacity)	• Round any whole number to a required degree of accuracy • Identify the value of each digit to three decimal places and multiply and divide numbers by 10,100 and 1000 where the answers are up to three decimal places. • Solve problems involving the calculation and conversion units of measure (g/kg ; ml/l) using decimal notation up to three decimal places. Link to place value understanding of scaling up and down by 1000 (x / ÷) • Use, read, write, and convert between standard units, converting measurements of mass and capacity from a smaller unit of measure to a larger unit and vice versa. • Estimate capacity using standard units to measure liquid (l/ml) and read scales graded in different sized steps (e.g. 0, 10, 20, 30…. 0, 25 , 50 , 75…. 0, 20, 40,60…) • Understand and use equivalences between metric units and common imperial units such as pounds and pints.
All four operations	Solve problems involving the calculation and conversion units of measure (g/kg ; ml/l) using decimal notation up to three decimal places. Link to place value understanding of scaling up and down by 1000 (x / ÷) • Use knowledge of the order of operations to carry out calculations involving the four operations • Know that distributivism can be expressed as a(b + c) = ab + ac. (e.g. 13 x 8 = 8(10 +3)) • Understand the terms factor, multiple and prime, square and cube numbers

and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2x 35: 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10).

• Identify common factors, common multiples, and prime numbers.

• Express missing number problems algebraically

• Find pairs of numbers that satisfy pairs of numbers involving two unknowns

• Solve problems involving addition, subtraction, multiplication, and division, deciding which operations and methods to use and why

• Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Year 6 Spring	
Fractions and ratio	Know that 1/10 = 0.1 and 1/100 = 0.01 • Recall and use equivalences between simple fractions, decimals, and percentages, including in different contexts. • Associate a fraction with division (3/8 = 3÷8) and calculate decimal fraction equivalents e.g. 0.375) for a simple fraction (e.g. 3/8) • Identify the value of each digit to three decimal places and multiply and divide numbers by 10,100,1000 where the answers are up to three decimal places. • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. • Solve problems involving ratio and proportion • Solve problems involving unequal sharing and grouping using knowledge of factors and multiples. They might use the notation a:b to record their work.
Geometry and angles with pie charts	interpret and construct pie charts and use these to solve problems, including comparison problems. • Draw given angles, and measure them in degrees (°) • Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
Subtraction and addition with • patterning and linear sequences • fractions	Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why. • Perform mental calculations, including with mixed operations and large numbers. • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy • Generate and describe linear number sequences • Add and subtract fractions with the different denominators and mixed numbers, using the concept of equivalent fractions. Use diagrams to support reasoning. • Solve problems which require answers to be rounded to specified degrees of accuracy. • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
Statistics with negative numbers and mean average	Use negative numbers in context and calculate intervals across zero • Interpret and construct line graphs and use these to solve problems. • Calculate and interpret the mean as an average

Measurement (volume, capacity, metric, and imperial)	Understand and use equivalences between metric units and common imperial units such as pounds and pints. • Convert between miles and kilometres. • Calculate, estimate, and compare volume of cubes and cuboids using standard units including cm^3 and m^3 and extending to other units such as mm^3 and km^3 • Identify 3-D shapes, including cubes and other cuboids, from 2-D representations • Multiply three numbers together, understanding that this can be done in any order and link this to the volume of cubes and cuboids. • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate in the context of capacity, length, and volume • Read a range of scales.
Algebra and formulae	Use simple formulae • Recognise when it is possible to use formulae for area and volume of shapes • Express missing number problems algebraically • Enumerate all possibilities of combinations of two variables.
All four operations with statistics (secure formal and informal methods)	Solve problems involving addition, subtraction, multiplication, and division, deciding which operations and methods to use and why. • Solve problems involving the calculation and conversion units of measure (g/kg ; ml/l) using decimal notation up to three decimal places .Link to place value understanding of scaling up and down by 1000 (x / ÷) • Use knowledge of the order of operations to carry out calculations involving the four operations • Know that distributivism can be expressed as a (b + c) = ab + ac. (e.g.13 x 8 = 8(10 +3)) • Understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2x 35: 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10). • Identify common factors, common multiples, and prime numbers. • Express missing number problems algebraically • Find pairs of numbers that satisfy pairs of numbers involving two unknowns • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. • Calculate the mean as an average • Solve comparison, sum and difference problems using information presented in a line graph or pie chart • Complete, read and interpret information in tables.
Geometry (position and direction)	Compare and classify geometric shapes based on their properties and sizes and find unknown angles. • Describe positions on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on a coordinate plane and reflect them in the axes.
Fractions (x and ÷)	Multiply simple pairs of proper fractions (show on an array), writing the answer in its simplest form e.g. ¼ x ½ = 1/8 • Divide proper fractions by whole numbers e.g. 1/3 ÷ 2 = 1/6

Year 6 Summer	
Multiplication and division including square, cube and prime numbers	Identify common factors, common multiples, and prime numbers. • Know and use the vocabulary of prime numbers, prime factors, and composite (non-prime) numbers. Construct arrays to show that prime numbers (p) have exactly one array (1 x p) • Recognise and use square numbers and cube numbers and the notation for (2) and (3). Construct arrays for square numbers to show that square numbers have an odd number of factors since one is repeated (e.g. 16 can be constructed as 1 x 16; 2 x 8 and 4 x 4 ~ factors are 1,2,4,8,16) • Solve problems involving all four operations including using their knowledge of factors and multiples, squares, and cubes.
Fractions and equivalence	Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions • Multiply simple pairs of proper fractions (show on an array), writing the answer in its simplest form e.g. ¼ x ½ = 1/8 • Divide proper fractions by whole numbers e.g. 1/3 ÷ 2 = 1/6
Addition and subtraction whole numbers and fractions	Partition (determine the value of each digit), compare and calculate with numbers up to 10,000,000 • Perform mental calculations, including with mixed operations and large numbers • Solve addition and subtraction multi-step problems in contexts, deciding which operations to use and why • Use estimation to check answers to calculations and determine, in the context of the problem, levels of accuracy. • Use knowledge of the order of operations to carry out calculation involving the four operations • Use simple formulae • Express missing number problems algebraically • Find pairs of numbers that satisfy number sentences involving two unknowns (e.g. a pair of numbers that sum to 10 and have a product of 24 = 6 and 4) • Generate and describe linear sequences • Describe positions on a full coordinate grid (all four quadrants), draw and translate simple shapes and reflect them in the axes. Notice how describing translations links to addition and subtraction of directed number. • Use negative numbers in context and calculate intervals across zero (link to coordinate axes and to temperature)
Multiplication and division with related facts	Perform mental calculations involving all four operations • Use estimation to check answers to calculations and determine, in the context of the problem, levels of accuracy • Identify common factors, common multiples and prime numbers • Express missing number problems algebraically • Use simple formulae
Fractions and geometry	Use common factors to simplify fractions • Use common multiples to express fraction in the same denomination • Compare and order fractions >1

	• Add and subtract fractions with different denominators, using the concept of equivalence • Multiply simple pairs of proper fractions • Divide proper fractions by whole numbers • Associate a fraction with division • Calculate decimal fractions by division (e.g. 1÷ 2 = 0.5) • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. • Draw 2-D shapes and simple nets for 3-D shapes using given dimensions and angles • Compare and classify geometric shapes • Find unknown angles in triangles, quadrilaterals and regular polygons • Recognise angles at a point, on a straight line, vertically opposite. Find missing angles in these cases.
Ratio and proportion	Solve problems involving the relative sizes of two quantities where the missing values can be found using integer multiplication and division facts (Use a: b notation) • Solve problems involving the calculation of percentages, e.g. 15% of 360 (link to calculating angles in pie charts) and the use of percentages for comparison. • Solve problems involving ratio and proportion. Pupils should recognise proportionality in contexts when the relations between quantities are in the same ratio such as similar shapes and recipes. • Solve problems involving similar shapes where the scale factor is known or can be found • Solve problems involving unequal sharing or grouping using knowledge of fractions and multiples. e.g. 'for every egg you need three spoonfuls of flour', '3/5 of the class are boys'. (These problems are the foundation for later formal approaches to ratio and proportion.) • Calculate the mean as average. • Interpret and construct pie charts and line graphs (axes -> scale) and use these to solve problems
Multiplication and division (secure formal methods)	Multiply up to 4-digit numbers by a 2-digit number using a formal written method • Divide up to 4-digit numbers by a 2-digit number using a formal written method • Interpret remainders from division as whole numbers, fractions, or by rounding as appropriate to the context • Use estimation to check answers to calculations and determine, in the context of the problem, levels of accuracy • Express missing number problems algebraically
All four operations with decimals and measure	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • Use, read, write and convert between all standard metric units. • Recognise that shapes with the same areas can have different perimeters and vice versa • Recognise when it is possible to use formulae for the area and volume of shapes. • Convert between miles and km. • Calculate the area of parallelograms and triangles • Calculate, estimate and compare volume of cubes and cuboids using standard metric units (mm3, cm3, m 3 km3).