Wickham Church of England Primary School

Maths Long Term Map – Year 6
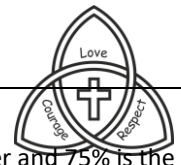
	lessons	Domain	Unit Objectives
Autumn 1	15	Number and Place Value	**Solve number and practical problems involving:** • **Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit.** • **Identify, represent and estimate numbers using different representations including number-lines** • **Round any whole number to a required degree of accuracy** (represent on a number line)
	(10)	Addition and subtraction including missing number	• **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 operations to carry out calculations involving the four operations**
	15	Multiplication and division including 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 bar-models to support conceptual understanding before solving. • **Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy**
	5	Fractions	• **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.**

Autumn 2	5	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.**
	5	Measurement (Time + timetables)	• 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
	10	Geometry (shape and angle/ parts of the	• **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 numberline). • **Draw and translate simple shapes in the coordinate plane and reflect them in the axes**
	10	NPV / 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.**
	5	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.**

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	10	Fractions and ratio (10)	• 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.
Spring term 1	5	Geometry (angle / pie charts) (5)	• **Interpret and construct pie charts and use these to solve problems,** including comparison problems. ⬚ Draw given angles, and measure them in degrees ( )^o • **Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.**
	15	Subtraction and addition / number place value patterning and linear sequences (mental strategies)	• **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.**
	5	Statistics (line graphs incltemperature and negative numbers,	• **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**

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Spring term 2	10	Measurement (length/volume and capacity/reading scales / 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 cm³ and m³ and extending to other units such as mm³ and km³** • **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 (including	• **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.**
	10	All four operations (secure the formal and informal methods) / statistics	• **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.
	10	Geometry (position	• **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.**
	(5)	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**

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Summer term 1	15	Multiplication and division (including square, cube and .	• **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.
			STATUTORY TESTING
	5	Fractions equivalence) (5)	• 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**
	5	Addition and subtraction / whole numbers and	• 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)

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	5	Multiplication and division (tables and 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 numbers problems algebraically ▯ Use simple formulae**
Summer term 2	10	Fractions/ 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.**

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	5	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**
	10	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 numbers problems algebraically**
	10	All four operations (context: 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 ad 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 (mm^3, cm^3, m^3 km^3).**

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