

Crosby Primary School
Mathematics Progression Document – Years 5 and 6



	Year 5	Year 6
Fluency	<ul style="list-style-type: none"> • Interpret negative numbers in context, count forwards/backwards with positive and negative whole numbers including 0 • Read, write, order and compare numbers to at least 1, 000, 000 and determine the value of each digit • Count forwards/backwards in steps of powers of 10 for any given number up to 1 000 000 • Round any number to at 1,000,000 to the nearest 10, 100, 1000,10 000, 100 000 • Read Roman numerals to 1000 (M) & recognise years written in Roman numerals • Add / subtract whole numbers with more than 4 digits using formal written methods, columnar add/subtraction • Add/ subtract numbers mentally, use increasingly large numbers • Solve add/subtraction • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Identify all multiples and factors for tables up to 12 x12, including finding all factor pairs of a number and all common factors of two number • Use vocabulary of prime numbers, prime factors & composites (non-prime) numbers • Establish where a number up to a 100 is prime & recall prime numbers up to 19 • Multiply/divide numbers mentally, known facts • Multiply numbers up to 4 digits by 1 & 2 digit using formal written method include long multiplication for 2 digit numbers • Divide numbers up to 4 digits by a 1 digit number using a formal written method/ short division & interpret remainders • Multiply/divide whole number/decimals by 10,100 1000 • Use squared/cubed numbers & the notation for squared /cubed • Compare/order fractions whose denominators are all multiples of the same number • Read and write decimal numbers as fractions e.g. $0.71 = \frac{71}{100}$ • Read , write , order and compare numbers up to 3 decimals places • Identify, name and write equivalent fractions of a given fraction represented visually include tenths and hundredths • Recognise/ use thousandths to relate then to tenths, hundredth & decimal equivalents • Recognise mixed numbers and improper fractions & convert form one form to the other and write mathematical statements • Add/subtract fractions with the same denominators & multiples of the same number • Multiply proper fractions and mixed numbers by whole numbers supported by materials and diagrams • Round decimals with 2 decimal places to the nearest whole number and 1 decimal place • Recognise the percent % symbol and understand that per cent relates to number parts per hundred • Convert between different units of metric measurement km /m, cm/m/cm/mm, kg/g l/ml • Measure and calculate the perimeter of composite rectilinear shapes cm and m • Calculate the area of rectangles (inc squares cm^2 and squared m^2 and estimate the area of an irregular shape • Draw given angles and measure them in degrees • Distinguish regular / irregular polygons based on reasoning about equal sides & angles • Complete read an interpret information in tables and timetables • Use approximate equivalences between metric /imperial units; inches, pounds, pints • Use 4 operations involving measures using decimal notation, include scaling • Estimate volume and capacity • Identify 3D shapes from 2D representations • Know angles are measure in degrees; estimates/ compare acute, obtuse & reflex angles • Identify angles at a point on a straight line, $\frac{1}{2}$ turn total 180 degrees -angles of a whole turn total 360/ multiples of 90 degrees • Identify, describe/represent the position of a shape following a reflection or translation 	<ul style="list-style-type: none"> • Use negative numbers in context, and calculate intervals across zero • Round any whole number to a required degree of accuracy • Read/write/order and compare numbers to at least 10 000 000 and determine the value of each digit • Perform mental calculations including with mixed operations and large numbers • Multiply multi- digit numbers up 4 digits by 2, whole numbers using the formal written method of long multiplication • Divide numbers up to 4 digits by 2 digit whole numbers using the formal written method long division & interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context • Identify common factors, common multiples and prime numbers • Divide numbers up to 4 digits by 2 digit numbers using the formal written method of short division where appropriate, interpreting remainders according to the context • Use knowledge of the order of operations to carry out calculations involving four operations • Use written division in cases where answer has up to 2 decimal places • Recall/use equivalence between simple fractions, decimals and percentages including different context • Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction $\frac{3}{8}$ • Identify the value of each digit to 3 decimal places and multiply & divide the numbers by 10 100 1000 where answers are up to 3 decimal places • Compare, order fractions > 1, use common factors to simplify fractions, use common multiples to express fractions in the same denomination • Add/subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions • Multiply simple pairs of proper fractions, in simplest form $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ • Multiply one digit numbers with up to 2 decimal places • Divide proper fractions by whole numbers $\frac{1}{3}$ divided by $2 = \frac{1}{6}$ • <u>Algebra</u> • Use simple formulae • Express missing numbers algebraically • Generate and describe linear number sequence • Find pairs of numbers that satisfy an equation with 2 unknowns Enumerate all possibilities of combinations of two variables • Use, read, write & convert between unit standard units, converting measurements of length, mass, volume & time from a smaller unit of measure to a larger unit, and vice versa using decimal notation to up to three decimal places • Compare and classify geometric shapes based on their properties/size, find unknown angles in any triangle, quadrilateral and irregular polygon • Draw and translate simple shapes on the coordinate plane and reflect them in the axes • Interpret line graphs, pie charts • Calculate and interpret the mean as an average • Calculate, estimate and compare volume of cubes and cuboids (cm^3, m^3, ext to mm^3 km^3) • Convert between miles and km • Recognise shapes with the same area can have different perimeters & vice versa • Calculate the area of a parallelogram & triangles • Recognise when to use a formulae for area & volume of shapes • Draw 2D shapes using given dimensions & angles • Recognise, describe& build simple 3D shapes inc nets • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles • Illustrate and name parts of circle include radius, diameter & circumference, know diameter is twice the radius • Describe the positions on the full coordinate grid (all 4 quadrants) • Construct line graphs, pie charts

	Year 5	Year 6
Reasoning	<ul style="list-style-type: none"> Reason with negative numbers in context, count forwards/backwards with positive and negative whole numbers including 0 Reason with read, write, order and compare numbers to at least 1, 000, 000 and determine the value of each digit Reason with counting forwards/backwards in steps of powers of 10 for any given number up to 1 000 000 Reason with rounding any number to at 1,000,000 to the nearest 10, 100, 1000,10 000, 100 000 Reason with Roman numerals to 1000 (M) & recognise years written in Roman numerals Reason with add / subtract whole numbers with more than 4 digits using formal written methods, columnar add/subtraction Reason with add/ subtract numbers mentally, use increasingly large numbers Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Reason with multiples and factors for tables up to 12 x12, including finding all factor pairs of a number and all common factors of two numbers Reason with prime numbers, prime factors & composites (non-prime) numbers Reason with Multiply/divide numbers mentally, known facts Reason with Multiply numbers up to 4 digits by 1 & 2 digit using formal written method include long multiplication for 2 digit numbers Reason with Divide numbers up to 4 digits by a 1 digit number using a formal written method/ short division & interpret remainders Reason with Multiply/divide whole number/decimals by 10,100 1000 Reason with squared/cubed numbers & the notation for squared /cubed Reason with compare/order fractions whose denominators are all multiples of the same number Reason with read , write , order and compare numbers up to 3 decimals places Reason with equivalent fractions of a given fraction represented visually include tenths and hundredths Reason with thousandths to relate then to tenths, hundredth & decimal equivalents Reason with mixed numbers and improper fractions & convert form one form to the other and write mathematical statements Reason with Add/subtract fractions with the same denominators & multiples of the same number Reason with multiplying proper fractions and mixed numbers by whole numbers supported by materials and diagrams Reason with rounding decimals with 2 decimal places to the nearest whole number and 1 decimal place Reason with percent % symbol and understand that per cent relates to number parts per hundred Reason with converting between different units of metric measurement km /m, cm/m/cm/mm, kg/g l/ml Reason with measure and calculate the perimeter of composite rectilinear shapes cm and m Reason with area of rectangles (inc squares cm² and squared m² and estimate the area of an irregular shape Reason with regular / irregular polygons based on reasoning about equal sides & angles Reason with interpret information in tables and timetables <i>Reason with equivalences between metric /imperial units; inches, pounds, pints</i> <i>Reason with 3D shapes from 2D representations</i> <i>Use the properties of rectangles to deduce related facts/ find missing lengths & angles</i> <i>Reason with angles; estimates/ compare acute, obtuse & reflex angles</i> <i>Reason with position of a shape following a reflection or translation</i> 	<ul style="list-style-type: none"> Reason with negative numbers in context, and calculate intervals across zero Reason with rounding any whole number to a required degree of accuracy Reason with read/write/order and compare numbers to at least 10 000 000 and determine the value of each digit Use estimation to check answers to calculations & determine in the context of problem, level of accuracy Reason with mental calculations including with mixed operations and large numbers Reason with multiplying multi- digit numbers up 4 digits by 2, whole numbers using the formal written method of long multiplication Reason with dividing numbers up to 4 digits by 2 digit whole numbers using the formal written method long division & interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context Reason with common factors, common multiples and prime numbers Reason with division - numbers up to 4 digits by 2 digit numbers using the formal written method of short division where appropriate, interpreting remainders according to the context Use knowledge of the order of operations to carry out calculations involving four operations Reason with written division in cases where answer has up to 2 decimal places Reason with equivalence between simple fractions, decimals and percentages including different context Reason with fractions and division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction 3/8 Reason with value of each digit to 3 decimal places and multiply & divide the numbers by 10 100 1000 where answers are up to 3 decimal places Reason with fractions > 1, use common factors to simplify fractions, use common multiples to express fractions in the same denomination Reason with add/subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions Reason with multiplying simple pairs of proper fractions, in simplest form $\frac{1}{4} \times \frac{1}{2} = 1/8$ Reason with multiplying one digit numbers with up to 2 decimal places Reason with dividing proper fractions by whole numbers $\frac{1}{3}$ divided by 2 = $1/6$ <u>Reason with algebra</u> Use simple formulae Express missing numbers algebraically Generate and describe linear number sequence Find pairs of numbers that satisfy an equation with 2 unknowns Enumerate all possibilities of combinations of two valuables Reason with standard units, converting measurements of length, mass, volume & time from a smaller unit of measure to a larger unit, and vice versa using decimal notation to up to three decimal places Reason with geometric shapes based on their properties/size, find unknown angles in any triangle, quadrilateral and irregular polygon Reason with translating simple shapes on the coordinate plane and reflect them in the axes Reason with line graphs, pie charts Reason with the mean as an average Reason with volume of cubes and cuboids (cm³, m³, ext to mm³ km³) Reason with converting between miles and km Reason with shapes with the same area can have different perimeters & vice versa Reason with area of a parallelogram & triangles Reason with formulae for area & volume of shapes Reason with 3D shapes inc nets Reason with angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles Reason with parts of circle include radius, diameter & circumference, know diameter is twice the radius Reason with positions on the full coordinate grid (all 4 quadrants)

	Year 5	Year 6
Solve Problems	<ul style="list-style-type: none"> • Solve number problems and practical problems that involve number and place value • Solve add/subtraction multi-step problems in context deciding which operation & methods to use and say why • Solve multiplication/division problems include scaling by simple fractions and problems involving simple rates • Solve problems involving x and / including their knowledge of factors, multiples, squares and cubes • Solve problems add/subtraction/multiplication/division & combination of these understanding the meaning of = sign • Solve problems which require knowing percent & decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10/25 • Solve problems involving numbers up to 3 decimal places • <i>Use 4 operations involving measures problems using decimal notation, include scaling</i> • <i>Solve problems converting between units of time</i> • <i>Solve comparison, sum/difference problems using information presented in a line graph</i> 	<ul style="list-style-type: none"> • Solve number problems and practical problems that involve place value and number • Solve addition/ subtraction multi-step problems in context deciding which operation/methods and why • Solve problems involving addition, subtraction, division and multiplication • Solve problems which require answers to be rounded to specified degrees of accuracy • <u>Ratio</u> Solve problems that involve; <ul style="list-style-type: none"> • Calculation of percentages of whole numbers, measures E.g. 15% of 360 • Unequal sharing/grouping using knowledge of fractions & multiples • Relative sizes of 2 quantities where missing values can be found using Integer multiplication/division facts • Similar shapes where the scale factor is known or can be found • Solve problems involving calculations & conversion of units of measure, using decimal notation to three decimal places where appropriate • Solve problems with line graphs, pie charts • Calculate and interpret the mean as an average