Maths Progression at Monkwray Junior School.

Place Value

	Year 3	Year 4	Year 5	Year 6
Place value: counting	★ Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number Autumn	★ count in multiples of 6, 7, 9, 25 and 1000 ★ count backwards through zero to include negative numbers Autumn	★ count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 ★ count forwards and backwards with positive and negative whole numbers, including through zero Autumn	
Place value: represent	★ identify, represent and estimate numbers using different representations ★ read and write numbers up to 1000 in numerals and words Autumn	★ identify, represent and estimate numbers using different representations ★ read Roman numerals to 100 (I to C) and know that over time, the numeral changed to include the concept of zero and place value Autumn	★ read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit ★ read Roman numerals to 1000 (M) and recognise years written in Roman numerals. Autumn	★ read write, order and compare numbers up to 10,000,000 and determine the value of each digit. Autumn
Place value: use PV and compare	★ recognise the place value of each digit in a three-digit number (hundreds, tens, ones) ★ compare and order numbers up to 1000 Autumn	★ find 1000 more or less than a given number ★ recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) ★ order and compare numbers beyond 1000 Autumn	★ (read, write) order and compare numbers to at least 1,000,000 and determine the value of each digit Autumn	★ (read, write) order and compare numbers up to 10,000,000 and determine the value of each digit Autumn

Place value: Problems and rounding	★ Solve number problems and practical problems involving these ideas Autumn	★ Round any number to the nearest 10, 100 and 1000 ★ Solve number and practical problems that involve all of the above and with increasingly large positive numbers Autumn	★ Interpret negative numbers in context ★ Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10000, and 100000 ★ Solve numbers problems and practical problems that involve all of the above Autumn	★ Round any whole number to a required degree of accuracy ★ Use negative numbers in context, and calculate intervals across zero ★ Solve number and practical problems that involve all of the above Autumn

Addition and Subtraction

	Year 3	Year 4	Year 5	Year 6
Addition and subtraction: recall, represent and use	★ Estimate the answer to a calculation and use the inverse operations to check answers Autumn	★ Estimate the answer to a calculation and use the inverse operations to check answers Autumn	★ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Autumn	
Addition and subtraction: calculations	★ add and subtract numbers mentally, including: a three-digit number and ones a three-digit number and tens a three-digit number and hundreds ★ add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction Autumn	★ add and subtract numbers with up to 4 digits using the formal written method of columnar addition and subtraction where appropriate Autumn	★ add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ★ add and subtract numbers mentally with increasingly large numbers Autumn	★ perform mental calculations, including with mixed operations and large numbers ★ use their knowledge of order of operations to carry out calculations involving the four operations Autumn

Addition and subtraction: solve problems	★ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction Autumn	★ solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why Autumn	★ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ★ solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Autumn	★ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Autumn

Multiplication and Division

	Year 3	Year 4	Year 5	Year 6
Multiplication and division: recall, represent and use	★ recall and use multiplication and division facts for the 3,4 and 8 multiplication tables Autumn	★ recall multiplication and division facts for multiplication tables up to 12 x 12 ★ use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers ★ recognise and use factor pairs and commutativity in mental calculations Autumn > Spring	★ 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, prime factors and composite (non-prime) numbers ★ establish whether a number up to 100 is prime and recall prime numbers up to 19 ★ recognise and use square numbers and cube numbers, and the notation for squared^2 and cubed^3 Autumn	★ identify common factors, common multiples and prime numbers ★ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy Autumn

Multiplication and division: calculations	★ write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods Autumn > Spring	★ multiply two-digit and three-digit numbers by a one-digit number using formal written layout Spring	★ multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers ★ multiply and divide numbers mentally drawing upon known facts ★ divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context ★ multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Autumn > Spring > Summer	★ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ★ divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ★ divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context ★ perform mental calculations, including with mixed operations and large numbers Autumn
Multiplication and division: solve problems	★ solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n	★ solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder	★ solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	★ solve problems involving addition, subtraction, multiplication and division Autumn

	objects are connected to m objects. Spring	correspondence problems such as n objects are connected to m objects. Spring	★ solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. Autumn > Spring	
Multiplication and division: combined operations			★ solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Spring	★ use their knowledge of the order of operations to carry out calculations involving the four operations Autumn

Fractions

	Year 3	Year 4	Year 5	Year 6
Fractions: recognise and write	★ count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 ★ recognise, find and write fractions of a discrete set of objects: unit fractions and nonunit fractions with small denominators ★ recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators – **Spring**	★ count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. Spring	★ identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ★ recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number Spring	

Fractions: compare	★ recognise and show, using diagrams, equivalent fractions with small denominators ★ compare and order unit fractions, and fractions with the same denominators Summer	★ recognise and show, using diagrams, families of common equivalent fractions Spring	★ compare and order fractions whose denominators are all multiples of the same number Spring	★ use common factors to simplify fractions; use common multiples to express fractions in the same denomination ★ compare and order fractions, including fractions > 1 Autumn
Fractions: calculations	★ add and subtract fractions with the same denominator within one whole Summer	★ add and subtract fractions with the same denominator Spring	★ add and subtract fractions with the same denominator and denominators that are multiples of the same number ★ multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Spring	★ add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions ★ multiply simple pairs of proper fractions, writing the answer in its simplest form ★ divide proper fractions by whole numbers Autumn
Fractions: solve problems	★ solve problems that involve all of the above Spring > Summer	★ solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number Spring		

Decimals

	Year 3	Year 4	Year 5	Year 6
Decimals: recognise and write		★ recognise and write decimal equivalents of any number of tenths or hundredths ★ recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ Spring > Summer	★ read and write decimal numbers as fractions [for example, 0.71 = 100 71] ★ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents Spring	★ identify the value of each digit in numbers given to three decimal places Spring
Decimals: compare		★ round decimals with one decimal place to the nearest whole number ★ compare numbers with the same number of decimal places up to two decimal places Summer	★ round decimals with two decimal places to the nearest whole number and to one decimal place ★ read, write, order and compare numbers with up to three decimal places Spring	
Decimals: calculations and problems		★ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths Spring	★ solve problems involving number up to three decimal places Summer	★ multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places ★ multiply one-digit numbers with up to two decimal places by whole numbers ★ use written division methods in cases where the answer has up to two decimal places ★ solve problems which require answers to be rounded to specified degrees of accuracy Spring

<u>Fractions, Decimals and Percentages</u>

	Year 3	Year 4	Year 5	Year 6
Fractions, decimals and percentages		★ solve simple measure and money problems involving fractions and decimals to two decimal places. Spring > Summer	★ recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ★ solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$ $\frac{1}{4}$ 1/5 2/5 4/5 and those fractions with a denominator of a multiple of 10 or 25. Spring	★ associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction ★ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Spring

Ratio and Proportion

	Year 3	Year 4	Year 5	Year 6
Ratio and proportion				★ 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 the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison ★ solve problems involving similar shapes where the

				scale factor is known or can be found ★ solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Spring

Algebra

	Year 3	Year 4	Year 5	Year 6
Algebra	★ Solve problems, including missing numbers problems ** note – although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by 'missing number' objectives in Y3 (and Y1/2).			★ use simple formulae ★ generate and describe linear number sequences ★ express missing number problems algebraically ★ find pairs of numbers that satisfy an equation with two unknowns ★ enumerate possibilities of combinations of two variables. Spring

Measurement

	Year 3	Year 4	Year 5	Year 6
Measurement: using measure	★ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) Spring > Summer	★ Convert between different units of measure [for example, kilometre to metre; hour to minute]	★ convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre;	★ solve problems involving the calculation and conversion of units of measure, using decimal notation up to three

		★ estimate, compare and calculate different measures Autumn > Spring > Summer	gram and kilogram; litre and millilitre) ★ understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints ★ use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. Summer	decimal places where appropriate ★ use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places ★ convert between miles and kilometres Spring
Measurement: money	★ add and subtract amounts of money to give change, using both £ and p in practical contexts Spring	★ estimate, compare and calculate different measures, including money in pounds and pence Summer	★ use all four operations to solve problems involving measure [for example, money] using decimal notation, including scaling. Summer	
Measurement: time	★ tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks ★ estimate and read time with increasing accuracy to the nearest minute; record and compare time	★ read, write and convert time between analogue and digital 12- and 24-hour clocks ★ solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	★ solve problems involving converting between units of time Summer	★ use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa Summer

	in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight ★ know the number of seconds in a minute and the number of days in each month, year and leap year ★ compare durations of events [for example to calculate the time taken by particular events or tasks]. Summer	Summer		
Measurement: perimeter, area and volume	★ measure the perimeter of simple 2-D shapes Spring	★ measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres ★ find the area of rectilinear shapes by counting squares Autumn > Spring	★ measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres ★ calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes ★ estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and	★ recognise that shapes with the same areas can have different perimeters and vice versa ★ recognise when it is possible to use formulae for area and volume of shapes ★ calculate the area of parallelograms and triangles ★ calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3

			capacity [for example, using water] Autumn > Summer	), and extending to other units [for example, mm3 and km3]. Spring

Geometry

	Year 3	Year 4	Year 5	Year 6
Geometry: 2D shapes	★ draw 2-D shapes Summer	★ compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes ★ identify lines of symmetry in 2-D shapes presented in different orientations Summer	★ distinguish between regular and irregular polygons based on reasoning about equal sides and angles ★ use the properties of rectangles to deduce related facts and find missing lengths and angles Summer	★ draw 2-D shapes using given dimensions and angles ★ compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons ★ illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius Summer
Geometry: 3D shapes	★ make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them		★ identify 3-D shapes, including cubes and other cuboids, from 2-D representations Summer	★ recognise, describe and build simple 3-D shapes, including making nets Summer

	Summer			
Geometry: angles and lines	★ recognise angles as a property of shape or a description of a turn ★ identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle ★ identify horizontal and vertical lines and pairs of perpendicular and parallel lines. Summer	★ identify acute and obtuse angles and compare and order angles up to two right angles by size ★ identify lines of symmetry in 2-D shapes presented in different orientations ★ complete a simple symmetric figure with respect to a specific line of symmetry. Summer	★ know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles ★ draw given angles, and measure them in degrees (o) ★ identify: ★ angles at a point and one whole turn (total 360o) ★ angles at a point on a straight line and 2 1 a turn (total 180o) ★ other multiples of 90o Summer	★ find unknown angles in any triangles, quadrilaterals, and regular polygons ★ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. Summer
Geometry: position and direction		★ describe positions on a 2-D grid as coordinates in the first quadrant ★ describe movements between positions as translations of a given unit to the left/right and up/down ★ plot specified points and draw sides to complete a given polygon. Summer	★ identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. Summer	★ describe positions on the full coordinate grid (all four quadrants) ★ draw and translate simple shapes on the coordinate plane, and reflect them in the axes. Summer

Statistics

	Year 3	Year 4	Year 5	Year 6
Statistics: present and interpret	★ interpret and present data using bar charts, pictograms and tables Spring	★ interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Summer	★ complete, read and interpret information in tables, including timetables. Autumn	★ interpret and construct pie charts and line graphs and use these to solve problems Summer
Statistics: solve problems	★ solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. Spring	★ solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. Summer	★ solve comparison, sum and difference problems using information presented in a line graph Autumn	★ calculate and interpret the mean as an average. Summer