St Joseph's Otley
Mathematic progression from EYFS to Year 6

Concept	DM	ELG	Y1	Y2	Y3	Y4	Y5	Y6
Number - Number and Place Value	Count beyond ten Link the number symbol (numeral)with its cardinal number value Subitise Count objects, actions and sounds	**Number** Have a deep understanding of number to 10, including the composition of each number Subitise (recognise quantities without counting)up to 5 **Numerical patterns** Verbally count beyond 20, recognising the pattern of the counting system	count to and across 100, forwards and backwards, beginning with 0 or 1,or from any given number count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens given a number, identify one more and one less identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least read and write numbers from 1 to 20in numerals and words	count in steps of 2, 3, and 5 from 0, and in tens from any number,forward and backward recognise the place value of each digit in a two-digit number (tens,ones) identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100; use <, > and = signs read and write numbers to at least 100 in numerals and in words use place value and number facts to solve problems	count from 0 in multiplesof 4, 8, 50 and 100; find 10 or 100 more or lessthan a given number recognise the place valueof each digit in a three- digit number (hundreds, tens, ones) compare and order numbers up to 1000 identify, represent and estimate numbers using different representations read and write numbersup to 1000 in numerals and in words solve number problemsand practical problems involving these ideas	count in multiples of 6, 7, 9, 25 and 1000 find 1000 more or less than a given number count backwards through zero to include negative numbers recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000 identify, represent and estimate numbers using different representations round any number to the nearest 10, 100 or 1000 solve number and practical problems that involve all of the above and with increasingly large positive numbers read Roman numerals to 100(I to C) and know that over time, the numeral system changed to include the concept of zero and place value	read, write, order and compare numbers to at least 1 000 000 anddetermine the value of each digit count forwards or backwards in steps of powers of 10 for any givennumber up to 1 000 000 interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, includingthrough zero round any number up to 1000000 to the nearest 10, 100, 1000, 10 000 and 100 000 solve number problems and practical problems that involve allof the above read Roman numerals to 1000 (M) and recognise years written in Roman numerals	read, write, order and compare numbers up to10 000 000 and determine the value ofeach digit round any whole numberto a required degree of accuracy use negative numbers in context, and calculate intervals across zero solve number and practical problems thatinvolve all of the above
Number - Addition and Subtraction **Refer to the written calculation progressions**	Automatically recall number bonds for numbers 0–5 and some to 10 Explore the composition ofnumbers to 10 Understand the'one more than/one less than' relationship between	**Number** Automatically recall (without reference to rhymes, counting or otheraids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. **Numerical patterns** Compare quantities up to10 in different contexts,	read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two- digit numbers to 20, including zero	solve problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods recall and use addition	add and subtract numbers mentally, including: - a three-digit numberand ones - a three-digit numberand tens - a three-digit numberand hundreds add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction estimate the answer to a calculation and use inverse operations to check	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate estimate and use inverse operations to check answers to a calculation solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	add and subtract whole numberswith more than 4 digits, includingusing formal written methods (columnar addition and subtraction) add and subtract numbers mentallywith increasingly large numbers use rounding to check answers tocalculations and determine, in thecontext of a problem, levels of accuracy solve addition and subtraction multi-step problems in contexts, deciding which operations and	**4 Operations** multiply multi-digit numbers up to 4 digits bya 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

	consecutive numbers Compare numbers	recognising when one quantity is greater than, less than or thesame as the other quantity	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ◯ – 9	and subtraction facts to 20 fluently, and derive and use related facts up to 100 add and subtract numbers using concrete objects, pictorial representations, and mentally, including:	answers solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction		methods to use and why	context divide numbers up to 4 digits by a two-digit number using the formalwritten method of short division where appropriate, interpreting remainders according tothe context
Number - Multiplication and Division **Refer to the written calculation progressions**		**Numerical patterns** Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally	solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations andarrays with the support of the teacher	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs show that multiplicationof two numbers can bedone in any order (commutative) and division of one number by another cannot solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	recall and use multiplication and divisionfacts for the 3, 4 and 8 multiplication tables 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 toformal written methods solve problems, including missing number problems, involving multiplication and division,including positive integer scaling problems and correspondence problemsin which n objects are connected to m objects	recall multiplication and division facts for multiplication tables up to 12 × 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 multiply two-digit and three-digit numbers by a one-digit number using formal written layout solve problems involving multiplying and adding, including using the distributivelaw to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	identify multiples and factors, including finding all factor pairs of anumber, 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 to100 is prime and recall prime numbers up to 19 multiply numbers up to 4 digits by a one- or two-digit number using aformal 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 aone-digit number using the formalwritten method of short division and interpret remainders appropriately for the context multiply and divide whole numbersand those involving decimals by 10, 100 and 1000 recognise and use square numbers and cube numbers, andthe notation for squared (^{2}) and cubed (^{3}) solve problems involving multiplication and division includingusing their knowledge of factors and multiples, squares and cubes solve problems involving addition, subtraction, multiplication and division and a combination of these, including	perform mental calculations, including with mixed operations andlarge numbers identify common factors, common multiples and prime numbers use their knowledge of the order of operations tocarry out calculations involving the four operations 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 use estimation to check answers to calculations and determine, in the context of a problem, anappropriate degree of accuracy

							understanding the meaning of the equals sign solve problems involving multiplication and division, including scaling by simple fractions and problems involvingsimple rates	
Number - Fractions (decimals and percentages)			recognise, find and name a half as one of two equal parts ofan object, shape or quantity recognise, find andname a quarter as one of four equal parts of an object, shape or quantity	recognise, find, name and write fractions 1/3,1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity write simple fractions for example, 1/2 of 6 =3 and recognise the equivalence of 2/4 and 1/2	count up and down in tenths; recognise that tenths arise from dividingan object into 10 equal parts and in dividing one-digit numbers or quantities by 10 recognise, find and write fractions of a discrete setof objects: unit fractions and non-unit fractions with small denominators recognise and use fractions as numbers: unitfractions and non-unit fractions with small denominators recognise and show, using diagrams, equivalent fractions withsmall denominators add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7] compare and order unit fractions, and fractions with the same denominators solve problems that involve all of the above	recognise and show, using diagrams, families of common equivalent fractions count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. 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 add and subtract fractions with the same denominator recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to 1/4, 1/2, 3/4 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 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 solve simple measure and money problems involving fractions and decimals to twodecimal places	compare and order fractions whose denominators are all multiples of the same number identify, name and write equivalentfractions 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 > 1as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5] add and subtract fractions with thesame denominator and denominators that are multiples ofthe same number multiply proper fractions and mixednumbers by whole numbers, supported by materials and diagrams read and write decimal numbers asfractions [for example, 0.71 = 71/100] recognise and use thousandthsand relate them to tenths, hundredths and decimal equivalents 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 decimalplaces solve problems involving number up to three decimal places recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages asa fraction with denominator	use common factors to simplify fractions; use common multiples to express fractions in the same denomination compare and order fractions, including fractions > 1 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 [for example, 1/4 × 1/2 =1/8] divide proper fractions by whole numbers [for example, 1/3 ÷ 2 =1/6] associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] identify the value of each digit in numbers given to three decimal places and 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

							100, and as a decimal solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5and those fractions with a denominator of a multiple of 10 or 25	rounded to specified degrees of accuracy recall and use equivalences between simple fractions, decimalsand percentages, including in different contexts
Ratio and Proportion	Continue, copy and create repeating patterns					**Use the language of ratio and proportion** **Understand the relationship between ratio, proportion andfractions** **Understand the relationshipbetween scaling and multiplication** **Create coloured strips, identifying the ratio and proportion of colours** **Solve recipe problems involving ratio and proportion,and scaling**	**Use the language of ratio andproportion** **Understand the relationship between ratio, proportion andfractions** **Understand the relationship between scaling and multiplication** **Create coloured strips, identifyingthe ratio and proportion of colours** **Solve recipe problems involvingratio and proportion, and scaling**	solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and divisionfacts solve problems involving the calculation of percentages [for example,of measures, and such as15% 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 knowledgeof fractions and multiples
Algebra			**Understand the power of the = sign** **Solve balancing calculations** **Recognise and use number sentences written in different ways** **Solve missing number calculations** **What's the same? What's the difference? questions**	**Understand < and >** **Understand the powerof the = sign** **Solve balancing calculations** **Recognise and use number sentences written in different ways** **Solve missing number calculations** **What's the same? What's the difference? questions**	**Understand < and >** **Understand the power of the = sign** **Solve balancing calculations** **Recognise and use number sentences writtenin different ways** **Solve missing number calculations** **What's the same? What's the difference? questions**	**Understand < and >** **Understand the power of the = sign** **Solve balancing calculations** **Recognise and use number sentences written in differentways** **Solve missing number calculations** **What's the same? What's the difference? questions**	**Understand < and >** **Understand the power of the = sign** **Solve balancing calculations** **Recognise and use number sentences written in different ways** **Solve missing number calculations** **What's the same? What's thedifference? questions**	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
Measurement	Compare length, weight and capacity		compare, describe and solve practical problems for: - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]	choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers,	measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) measure the perimeter of simple 2-D shapes add and subtract amountsof money to give change, using	Convert between different units of measure [for example, kilometre to metre; hour to minute] measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litreand millilitre) understand and use approximate equivalences between metric unitsand common imperial units	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 standard

			- mass/weight[for example,heavy/light, heavier than,lighter than] - capacity and volume [for example, full/empty, more than, lessthan, half, half full, quarter] time [for example, quicker, slower,earlier, later] measure and beginto record the following: - lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds) recognise and know the value of different denominations of coins and notes sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] recognise and use language relating to dates, including daysof the week, weeks, months and years tell the time to the hour and half past the hour and draw the hands on a clockface to show these times	scales, thermometers and measuring vessels compare and order lengths, mass, volume/capacity and record the results using >, < and = recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change compare and sequence intervals of time tell and write the time tofive minutes, including quarter past/to the hourand draw the hands on a clock face to show these times know the number of minutes in an hour and the number of hours ina day	both £ and p in practical contexts tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hourclocks estimate and read time with increasing accuracy to the nearest minute and compare timein 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 andthe number of days in each month, year and leap year compare durations of events [for example to calculate the time takenby particular events or tasks]	find the area of rectilinear shapes by counting squares estimate, compare and calculate different measures, including money in pounds and pence 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	such as inches, pounds and pints measure and calculate the perimeter of composite rectilinearshapes in centimetres and metres calculate and compare the area of rectangles (including squares), andincluding using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [forexample, using water] solve problems involving converting between units of time use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	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 recognise that shapes with the same areas can have different perimetersand 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 cubesand cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]
Geometry – properties of shapes	Compose and decompose shapes so that children recognise a shape can haveother shapes within it, just as numbers can Select, rotate		recognise and name common 2-D and 3-D shapes, including: - 2-D shapes [for example, rectangles (including squares), circles and triangles] - 3-D shapes [for example, cuboids (including cubes),	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes indifferent orientations anddescribe them recognise angles as a property of shape or a description of a turn identify right angles,	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify acute and obtuse angles and compare and order angles up to two right angles by size identify lines of symmetry in 2-	identify 3-D shapes, including cubes and other cuboids, from 2-Drepresentations know angles are measured in degrees: estimate and compareacute, obtuse and reflex angles draw given angles, and measurethem in degrees (°)	draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets compare and classify geometric shapes based on their properties and sizes and find unknown angles in

	and manipulate shapes to develop spatial reasoning skills		pyramids and spheres]	identify 2-D shapes on the surface of 3-D shapes [for example, a circle on a cylinder anda triangle on a pyramid] compare and sort common 2-D and 3-D shapes and everyday objects	recognise that two right angles make a half-turn, three make three quartersof 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	D shapes presented in different orientations complete a simple symmetric figure with respect to a specific line of symmetry	identify: - angles at a point and one whole turn (total 360^{o}) - angles at a point on a straight line and 1/2 a turn (total 180^{o}) - other multiples of 90^{o} use the properties of rectangles todeduce related facts and find missing lengths and angles distinguish between regular and irregular polygons based on reasoning about equal sides and angles	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 recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Geometry – position and direction			describe position, direction and movement, including whole, half, quarter and three-quarter turns.	order and arrange combinations of mathematical objects inpatterns and sequences use mathematical vocabulary to describe position, direction and movement, including movement in a straightline and distinguishing between rotation as a turn and in terms of right angles for quarter,half and three-quarter turns (clockwise and anti-clockwise)	**Recap Y2 objectives and prepare for Y4 objectives**	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	identify, describe and represent theposition of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	describe positions on the full coordinate grid (all four quadrants) draw and translate simpleshapes on the coordinateplane, and reflect them inthe axes
Probability						**Use dice and spinner activitiesto introduce the language of probability**	**Use dice and spinner activities to introduce the language of probability**	**Use dice and spinner activities to introduce the language of probability**