Emmaus Federation Maths Progression by strand

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	estimate how many objects they can see and count them, find the total number of two sets of objects by counting them all	•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	•count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward	•count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.	•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	•count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 •interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	•use negative numbers in context, and calculate intervals across zero
Place Value	place numbers in order		•recognise the place value of each digit in a two-digit number •compare and order numbers from 0 up to 100; use and = signs	•recognise the place value of each digit in a three-digit number •compare and order numbers up to 1000	•recognise the place value of each digit in a four-digit number •order and compare numbers beyond 1000 •round any number to the nearest 10, 100 or 1000	•read, write, order and compare numbers up to 1 000 000 and determine the value of each digit •round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	•read, write, order and compare numbers up to 10 000 000 and determine the value of each digit •round any whole number to a required degree of accuracy
Representing number	select the correct numeral for 1 to 20 objects	•identify and represent numbers using objects and pictorial representations including the number line, & use language of: equal to, more than, less than (fewer), most, least •read and write numbers from 1 to 20 in numerals and words •read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	•identify, represent and estimate numbers using different representations, including the number line •read and write numbers to at least 100 in numerals and in words	•identify, represent and estimate numbers using different representations •read and write numbers up to 1000 in numerals and in words	•identify, represent and estimate numbers using different representations •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 Roman numerals to 1000 (M) and recognise years written in Roman numerals •recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	
Number Facts (+/-)	use the language of more and fewer to compare two sets of objects, find one more or less in the given number up to 20	•given a number, identify one more and one less •represent and use number bonds and related subtraction facts within 20	•use place value and number facts to solve problems recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
Mental +/_	Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.	add and subtract one-digit and two-digit numbers to 20, including zero	•add and subtract numbers using concrete objects, pictorial representations, and mentally, including: TU+U, TU+T, TU+TU and U+U+U •show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	•add and subtract numbers mentally, including: HTU+U, HTU+T and HTU+H		•add and subtract numbers mentally with increasingly large numbers	•perform mental calculations, including with mixed operations and large numbers
Written +/-				•add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	•add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	•add and subtract whole numbers with more than 4 digits, including using formal written methods	
Problems+/-		•solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9..	•solve problems with addition and subtraction, using concrete, pictorial and abstract representations •recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	•estimate the answer to a calculation and use inverse operations to check answers •solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	•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	•use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy •solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	
Number facts (x/÷)			•recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	•recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	•recall multiplication and division facts for multiplication tables up to 12 × 12	•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	•identify common factors, common multiples and prime number
Mental (x/÷)			calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs•show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	•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 methods	•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 and divide numbers mentally drawing upon known facts •multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	•perform mental calculations, including with mixed operations and large numbers
Written(x/÷)				•Progress to formal written methods calculations as above	•multiply two-digit and three-digit numbers by a one-digit number using formal written layout •	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including	•multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of

						long multiplication for two-digit numbers •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	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 context
Problems (x/÷)		solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	. •solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	•solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	•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 and a combination of these, including understanding the meaning of the equals sign •solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	•use their knowledge of the order of operations to carry 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, an appropriate degree of accuracy
Recognising factors	Begin to solve problems involving doubling, halving and sharing	•recognise, find and name a half as one of two equal parts of an object, shape or quantity •recognise, find and name 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	•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	•count up and down in hundredths; •recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	•recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number	
Comparing Fractions				•compare and order unit fractions, and fractions with the same denominators •recognise and show, using diagrams, equivalent fractions with small denominators	•recognise and show, using diagrams, families of common equivalent fractions	•compare and order fractions whose denominators are all multiples of the same number •identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	•use common factors to simplify fractions •use common multiples to express fractions in the same denomination •compare and order fractions, including fractions > 1
Finding fractions of quantities				recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators •recognise and use fractions as numbers: unit fractions and nonunit fractions with small denominators	•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		
Fraction calculations			•write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2.	•add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7]	•add and subtract fractions with the same denominator	•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	•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
Decimals as fractional amounts					•recognise and write decimal equivalents of any number of tenths or hundredths •recognise and write decimal equivalents to ¼, ½ and ¾ •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	•read and write decimal numbers as fractions	•associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction •identify the value of each digit in numbers given to three decimal places
Ordering decimals					•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	•recognise and use thousandths and 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 decimal places	
Calculating with decimals							multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places •multiply one-digit number with up to two decimal

							places by whole numbers •use written division methods in cases where the answer has up to two decimal places
Percentages						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 involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
Fraction problems				•solve problems using all fraction knowledge	•solve simple measure and money problems involving fractions and decimals to two decimal places	•solve problems involving number up to three decimal places •solve problems which require knowing percentage and decimal equivalents of ½ , ¼ , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25	•solve problems which require answers to be rounded to specified degrees of accuracy •recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
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 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.
Algebra							•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.
Measures	order two or three items by LEDs or height, order two items by weight or capacity, use everyday language to talk about size weight capacity, distance, order in sequence familiar events	•compare, describe and solve practical problems for: length/height, weight/mass, capacity/volume & time •measure and begin to record length/height, weight/mass, capacity/volume & time	•choose and use appropriate standard units to estimate and measure length/height (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels •compare and order lengths, mass, volume/capacity and record the results using >, < and =	•measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	•Convert between different units of measure estimate, compare and calculate different measures, including money in pounds and pence	•convert between different units of metric measure •understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints •estimate volume and capacity	•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 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
Mensuration				measure the perimeter of simple 2-D shapes	•measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares	•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 (cm^2) and square metres (m^2) and estimate the area of irregular shapes.	•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), and extending to other units
Money	use everyday language to talk about money	•recognise and know the value of different denominations of coins and notes	•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	•add and subtract amounts of money to give change, using both £ and p in practical contexts		•use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	
Time	use everyday language to talk about time,	sequence events in chronological order using language recognise and use language relating to dates, including days of the week, weeks, months and years •tell the time to	•compare and sequence intervals of time •tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times	•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	•Convert between different units of measure (e.g. Hours to minutes) •read, write and convert time between analogue and digital 12- and 24-hour clocks •solve problems	•solve problems involving converting between units of time	

		the hour and half past the hour and draw the hands on a clock face to show these times	•know the number of minutes in an hour and the number of hours in a day	increasing accuracy to the nearest minute; record and compare time 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	involving converting from hours to minutes; minutes to seconds; years to months; weeks to days		
Shape vocabulary	begin to use everyday terms to describe shapes, recognise create and describe patterns,	•recognise and name common 2-D shapes (e.g. Square, circle, triangle) •recognise and name common 3-D shapes (e.g. Cubes, cuboids, pyramids & spheres))	(vertices, edges, faces, symmetry	•identify horizontal and vertical lines and pairs of perpendicular and parallel lines			•illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Properties of 2-D shapes	begin to use everyday names for 2D shape's		•identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line. •compare and sort common 2-D and 3-D shapes and everyday objects	•draw 2-D shapes	. •compare and classify geometric shapes, including quadrilaterals and triangles, based on properties and sizes •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	. •use the properties of rectangles to deduce related facts and find missing lengths and angles •distinguish between regular and irregular polygons based on reasoning about equal sides and angles	. •draw 2-D shapes using given dimensions and angles compare and classify geometric shapes based on their properties and sizes
Properties of 3 D shapes	begin to use everyday names for 3D shapes		•identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces •identify 2-D shapes on the surface of 3-D shapes. compare and sort common 2-D and 3-D shapes and everyday objects.	•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	•recognise, describe and build simple 3-D shapes, including making nets •find unknown angles in any triangles, quadrilaterals, and regular polygons
Angles				•recognise angles as a property of shape or a description of a turn •identify right angles, recognise that two right angles make a halfturn, three make three quarters of a turn and four a complete turn •identify whether angles are greater or less than right angle	•identify acute and obtuse angles and compare and order angles up to two right angles by size	•know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles •draw given angles, and measure them in degrees (°) •identify angles at a point and one whole turn (total 360°); at a point on a straight line and ½ a turn (total 180°) •identify other multiples of 90°	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Position and direction	use everyday language to talk about position and distance	describe position, direction and movement, including whole, half, quarter and three-quarter turns	•order and arrange combinations of mathematical objects in patterns and sequences. •use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and ¾ turns		•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 the position 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 simple shapes on the coordinate plane, and reflect them in the axes.
Interpreting data			•interpret and construct simple pictograms, tally charts, block diagrams and simple tables	•interpret and present data using bar charts, pictograms and tables	•interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	•complete, read and interpret information in tables, including timetables	•interpret and construct pie charts and line graphs calculate and interpret the mean as an average
Extract from data			•ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity •ask and answer questions about totalling and comparing categorical data	•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	•solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	•solve comparison, sum and difference problems using information presented in a line graph	•use pie charts and line graphs to solve problems