East Midlands Academy Trust
Curriculum Mapping – Maths

Progression Maps

East Midlands Academy Trust
Maths Skill Progress Map – Number

- Number
- Addition and Subtraction
- Multiplication and Division
- Fractions, Decimals, Percentages and Ratio
- Measures
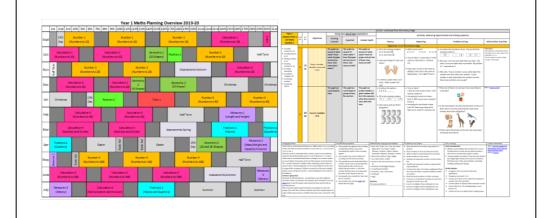- Measures – Money
- Measures – Time
- Geometry
- Position
- Statistics
- Algebra

These set out the progression through each year group in key topic areas. Each one is divided further in sub categories showing the pathway in developing understanding.

Long Term Planning and Scheme of Work

Year 1 Maths Planning Overview 2019-20

- Reception
- Year 1
- Year 2
- Year 3
- Year 4
- Year 5
- Year 6

This details the sequencing of knowledge and concepts intended to build mathematical understanding systematically over time. This reflects a higher proportion of teaching time on 'high value' areas: number, place value and calculations.
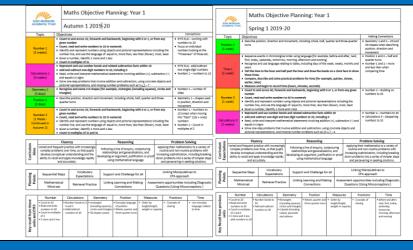Although the Scheme of Work details the length of time required to teach concepts, this is flexible so that gaps in pupils' mathematical knowledge can be addressed.

The Scheme of Work details additional information for teachers including;
- Pedagogical support
- Common misconceptions
- Mathematical language and notation
- Possible success criteria
- Prior learning required

Teachers plan from the Scheme of Work onto the short term planning template and use other materials to supplement this.

Shorter Term Planning Templates

Maths Objective Planning: Year 1
Autumn 1 2019-20

Maths Objective Planning: Year 1
Spring 1 2019-20

- Reception
- Year 1
- Year 2
- Year 3
- Year 4
- Year 5
- Year 6

The short term allows teachers to focus on the following areas when planning a sequence of learning:
- Clearly articulated content objectives
- Fluency, reasoning, problem solving objectives (separate document which details these)
- Number of days dedicated to a sequence of learning (including sequential small steps)
- Linking learning to prior knowledge and making connections to other learning
- Representation and structure (CPA)
- Misconceptions
- Assessment opportunities, including diagnostic questions (from diagnosticquestions.com)
- Vocabulary and using correct mathematical language
- Support and challenge for all (i.e. differentiation)
- Retrieval Practice (re-visiting topics) for recall of key skills

East Midlands Academy Trust
Maths Skill Progress Map – Number

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number		*Continue to count in ones, tens and hundreds, so that they become fluent in the order and place value of numbers to 1000. 9Non-Statutory Guidance)*	Count backwards through 0 to include negative numbers	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0	Use negative numbers in context, and calculate intervals across 0
	Given a number, identify 1 more and 1 less		Find 10 or 100 more or less than a given number	*Counting in tens and hundreds, maintain fluency in other multiples through varied and frequent practice. (Non-Statutory Guidance)*		
				Find 1,000 more or less than a given number		
	Count in multiples of 2s and 5s	Count in steps of 2, 3, and 5 from 0, and in 10s 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 1,000 (From Calculations)*	Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	
		Count in multiples of three to support their later understanding of a third (non-Statutory Guidance)	*Count up and down in tenths (From Fractions)*	*Count up and down in hundredths (From Fractions)*	*Recognise and describe linear number sequences (for example, 3, 3u1/2, 4, 4u1/2...), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add 1/2). (Non-Statutory Guidance)*	
Comparing Numbers	Use the language of: equal to, more than, less than (fewer), most, least	Compare and order numbers from 0 up to 100; use <, > and = signs	Compare and order numbers up to 1,000	Order and compare numbers beyond 1,000	order and compare numbers to at least 1,000,000.	order and compare numbers up to 10,000,000
				Compare numbers with the same number of decimal places up to 2 decimal places (Fractions Unit)	Read, write, order and compare numbers with up to 3 decimal places	
Identifying, representing and estimating	Identify and represent numbers using objects and pictorial representations including the number line	Identify, represent and estimate numbers using different representations, including the number line	Identify, represent and estimate numbers using different representations	Identify, represent and estimate numbers using different representations		*Use the whole number system, including saying, reading and writing numbers accurately. (Non-Statutory Guidance)*
				Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1000 (Non-Statutory Guidance)		
Reading and Writing	Count, read and write numbers to 20 in numerals and words	Read and write numbers to at least 100 in numerals and in words	Read and write numbers up to 1,000 in numerals and in words		Read and write numbers to at least 1,000,000.	Read and write numbers up to 10,000,000
Roman Numerals			*Tell and write the time from an analogue clock, including using 12-hour clocks, 24-hour clocks and using Roman Numerals from I to XII (From Time Unit)*	Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value	Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	
				Roman numerals should be put in their historical context so pupils understand that there have been different ways to write whole numbers and that the important concepts of zero and place value were introduced over a period of time. (Non-Statutory Guidance)		
Understanding Place Value	*Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations. (Non-Statutory Guidance)*	Recognise the place value of each digit in a two-digit number (10s, 1s)	Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)	Recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s)	Determine the value of each digit in numbers up to 1,000,000	Determine the value of each digit in numbers up to 10,000,000
		Partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13). (Non-Statutory Guidance)	recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	Identify the value of each digit in numbers given to 3 decimal places
		Begin to understand zero as a place holder. (Non-Statutory Guidance)	*Use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, (for example, 146 = 100 + 40 and 6, 146 = 130 + 16). (Non-Statutory Guidance)*	*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 (From Fractions)*	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	*multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places (Fractions)*
Rounding				Round any number to the nearest 10, 100 or 1,000	Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	Round any whole number to a required degree of accuracy
				Round decimals with 1 decimal place to the nearest whole number (From Fractions)	Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place	
				Connect estimation and rounding numbers to the use of measuring instruments (Non-Statutory Guidance)		
Properties of Number: Factors, multiples, Primes, Square and Cube Numbers				Recognise and use factor pairs and commutativity in mental calculations	Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers	Identify common factors, common multiples and prime 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)	
Problem Solving		Use place value and number facts to solve problems	Solve number problems and practical problems involving these ideas (number and Place Value)	Solve number and practical problems that involve all of the above and with increasingly large positive numbers	Solve number problems and practical problems that involve all of the above	Solve number and practical problems that involve all of the above

Every child deserves to be the best they can be

East Midlands Academy Trust
Maths Skill Progress Map – Addition and Subtraction

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number Bonds	Represent and use number bonds and related subtraction facts within 20 *Memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 – 7 = 9; 7 = 16 – 9). (Non-Statutory Guidance)*	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
Mental calculation	Add and subtract one-digit numbers to 20, including 0 *Combine and increase numbers, counting forwards and backwards (Non-Statutory Guidance)*	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including • adding 3 one-digit numbers, • a two-digit number and 1s, • a two-digit number and 10s • 2 two-digit numbers	Add and subtract numbers mentally, including • a three-digit number and 1s, • a three-digit number and 10s, • a three-digit number and 100s		Add and subtract numbers mentally with increasingly large numbers	Perform mental calculations, including with mixed operations and large numbers
	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs *Realise the effect of adding or subtracting zero. (Non-Statutory Guidance)*	Show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot *Practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100; 100 – 70 = 30 and 70 = 100 – 30. (Non-Statutory Guidance)*	*Practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100. (Non-Statutory Guidance)*	*Continue to practise both mental methods and written methods addition and subtraction with increasingly large numbers to aid fluency. (Non-Statutory Guidance)*	*Practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). (Non-Statutory Guidance)*	Use their knowledge of the order of operations to carry out calculations involving the 4 operations
Written Methods	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including • adding 3 one-digit numbers, • a two-digit number and 1s, • a two-digit number and 10s • 2 two-digit numbers	Add and subtract numbers with up to 3 digits, using a variety of methods *Add and subtract amounts of money to give change, using both £ and p in practical contexts (From Measures – Money)*	Add and subtract numbers with up to 4 digits using a variety of methods	Add and subtract whole numbers with more than 4 digits using a range of methods and a Concrete/Pictorial/Abstract approach	
Inverse Operations, Estimating and Checking Answers	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 3 = ? – 7	Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems *Check calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition. (Non-Statutory Guidance)*	Estimate the answer to a calculation and use inverse operations to check answers	Estimate and use inverse operations to check answers to a calculation	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. *Explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. (Non-Statutory Guidance)*
Problem Solving	*Discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly. (Non-Statutory Guidance)*	Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		Solve problems with addition and subtraction applying their increasing knowledge of mental and written methods				*Solve problems involving similar shapes where the scale factor is known or can be found (From FDP)*
		Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (From Measures – Money)				*Round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures. (Non-Statutory Guidance)*

Every child deserves to be the best they can be

East Midlands Academy Trust
Maths Skill Progress Map – Multiplication and Division

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division Facts	Count in multiples of 2s, 5s and 10s	*Count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward (From Number)*	*Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number (From number)*	Count in multiples of 6, 7, 9, 25 and 1,000	*Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 (From Number)*	
		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		
Mental Calculation	*Make connections between arrays, number patterns, and counting in twos, fives and tens (Non-Statutory Guidance)*	*Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. (Non-Statutory Guidance)*	*Estimate the answer to a calculation and use inverse operations to check answers (From Addition and Subtraction)*	*Estimate and use inverse operations to check answers to a calculation (From Addition and Subtraction)*	Multiply and divide numbers mentally, drawing upon known facts	Perform mental calculations, including with mixed operations and large numbers
			Develop efficient mental methods, for example, using commutativity and associativity (for example, 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) and multiplication and division facts (for example, using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (for example, 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3). (Non-Statutory Guidance)	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers	*Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 (From Number – Understanding Place Value)*	*Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] (From Fractions)*
				Practise mental methods and extend this to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6). (Non-Statutory Guidance)	*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 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10). (Non-Statutory Guidance)*	*Explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. (Non-Statutory Guidance)*
		Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot	Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot	*Recognise and use factor pairs and commutativity in mental calculations (Also in Number Properties)*	*Distributivity can be expressed as a(b + c) = ab + ac. (Non-Statutory Guidance)*	Use their knowledge of the order of operations to carry out calculations involving the 4 operations
Written Calculation	*Through grouping and sharing small quantities, begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities. (Non-Statutory Guidance)*	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	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 a variety of written methods	Multiply two-digit and three-digit numbers by a one-digit number using a variety of methods	Multiply numbers up to 4 digits by a one- or two-digit number using a range of methods	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
						Multiply one-digit numbers with up to 2 decimal places by whole numbers
		Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4). (Non-Statutory Guidance)		*Write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60. (Non-Statutory Guidance)*	Divide numbers up to 4 digits by a one-digit number using a range of methods and interpret remainders appropriately for the context	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
					Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 98/4 = 24 r2 = 24u1/2 = 24.5 ≈25) (Non-Statutory Guidance)	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
						Use written division methods in cases where the has up to 2 decimal places
Problem Solving	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 involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Solve problems involving addition, subtraction, multiplication and division
			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 number up to 3 decimal places	
					Use all four operations to solve problems involving measure [money] using decimal notation, including scaling (From Measures)	
			Solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits? 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children). (Non-Statutory Guidance)	*Solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.(Non-Statutory Guidance)*	*Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes (From Number)*	*Round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures. (Non-Statutory Guidance)*

Every child deserves to be the best they can be

East Midlands Academy Trust
Maths Skill Progress Map – Fractions, Decimals, Percentages and Ratio

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting and Sequences		*Count in fractions up to 10, starting from any number and using the 1/2 and 2/4 equivalence on the number line (Non-Statutory Guidance)*	Count up and down in tenths — *Connect tenths to place value, decimal measures and to division by 10. (Non-Statutory Guidance)*	Count up and down in hundredths — *Practise counting using simple fractions and decimals, both forwards and backwards. (Non-Statutory Guidance)*	*Continue to practise counting forwards and backwards in simple fractions. Extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line (Non-Statutory Guidance)*	*Generate and describe linear number sequences (with fractions) (From Algebra)*
Recognising	Recognise, find and name a half as 1 of 2 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	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators — *Recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity. (Non-Statutory Guidance)*	Recognise and show, using diagrams, families of common equivalent fractions — *Extend the use of the number line to connect fractions, numbers and measures. (Non-Statutory Guidance)* — *Connect hundredths to tenths and place value and decimal measure (Non-Statutory Guidance)*	Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5]	*Use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle. (Non-Statutory Guidance)*
	Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	*Use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. Connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. (Non-Statutory Guidance)*	Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
			Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	*Understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths. (Non-Statutory Guidance)*	Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction	
Comparing and Ordering			Compare and order unit fractions, and fractions with the same denominators	Compare numbers with the same number of decimal places up to 2 decimal places	Compare and order fractions whose denominators are all multiples of the same number	Compare and order fractions, including fractions >1
Equivalence	*Connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole. (Non-Statutory Guidance)*	Recognise the equivalence of 2/4 and 1/2 — *Meet 3/4 as the first example of a non-unit fraction. (Non-Statutory Guidance)*	Recognise and show, using diagrams, equivalent fractions with small denominators — *Begin to understand unit and non-unit fractions as numbers on the number line, and to deduce relations between them, such as size and equivalence. They should go beyond the [0, 1] interval, including relating this to measure. (Non-Statutory Guidance)*	Recognise and write decimal equivalents of any number of tenths or hundreds — *Recognise and write decimal equivalents to 1/4 , 1/2 , 3/4* — *Make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Pupils use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example, 6/9 = 2/3 or 1/4 = 2/4). (Non-Statutory Guidance)*	Read and write decimal numbers as fractions [for example, 0.71 = 71/100] — Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths — Solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25 — *Make connections between percentages, fractions and decimals (for example, 100% represents a whole quantity and 1% is 1/100, 50% is 50/100, 25% is 25/100) and relate this to finding 'fractions of'. (Non-Statutory Guidance)*	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 — Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
Calculating		Write simple fractions, for example 1/2 of 6 = 3	*Add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7]* — *Understand the relation between unit fractions as operators (fractions of), and division by integers. (Non-Statutory Guidance)*	Add and subtract fractions with the same denominator — *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 (From Fractions)* — Round decimals with 1 decimal place to the nearest whole number	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 — *Connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1. (Non-Statutory Guidance)* — *Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place (Also in Number)*	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] — *Round any whole number to a required degree of accuracy (Also in Number)*
Problem Solving and Ratio			Solve problems that involve the above — *Practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency. (Non-Statutory Guidance)*	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 — *Solve simple measure and money problems involving fractions and decimals to two decimal places (From Measures)*	Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates — *Say, read and write decimal fractions and related tenths, hundredths and thousandths accurately and are confident in checking the reasonableness of their answers to problems. (Non-Statutory Guidance)*	Solve problems - involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison - involving unequal sharing and grouping using knowledge of fractions and multiples - involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts - involving similar shapes where the scale factor is known or can be found

Every child deserves to be the best they can be

East Midlands Academy Trust
Maths Skill Progress Map – Measures

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Comparing and Estimating	Compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]; mass/weight [for example, heavy/light, heavier than, lighter than]; capacity/volume [for example, full/empty, more than, less than, half, half full, quarter]	Compare and order and record the results using >, < and =: lengths; mass; volume/capacity; temperature	Compare: lengths (m/cm/mm); mass (kg/g); capacity (l/ml). *The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or five times as high) and this connects to multiplication. (Non-Statutory Guidance)*	Estimate and compare different measures	Compare the area of rectangles (including squares), 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 capacity [for example, using water]	Estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]
Measuring and Calculating	Measure and begin to record: lengths and heights; mass and weight; capacity and volume. *In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers.(Non-Statutory Guidance)*	Choose and use appropriate standard units to estimate and measure: length/height in any direction (m/cm) to the nearest appropriate unit, using rulers.; mass (kg/g) to the nearest appropriate unit, using scales.; capacity (litres/ml) to the nearest appropriate unit, using measuring vessels; temperature (°C); to the nearest appropriate unit, using thermometers	Measure, add and subtract: lengths (m/cm/mm); mass (kg/g); capacity (l/ml). *Continue to measure using the appropriate tools and units. (Non-Statutory Guidance)*	Calculate different measures	*Calculate the area from scale drawings using given measurements.(Non-Statutory Guidance)*	*Use, add and subtract positive and negative integers for measures such as temperature.(Non-Statutory Guidance)*
Conversion	*Move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. (Non-Statutory Guidance)*	*Use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. (Non-Statutory Guidance)*	Progress to using a wider range of measures, including comparing and using mixed units (for example, 1 kg and 200g) and simple equivalents of mixed units (for example, 5m = 500cm). *Use multiplication to convert from larger to smaller units. (Non-Statutory Guidance)*	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; 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, 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 3 decimal places. Convert between miles and kilometres. *Connect conversion (for example, from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs. (Non-Statutory Guidance)*
Solving Problems	*Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 23 = ? – 4 (From Calculations)*		Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Solve simple measure and money problems involving fractions and decimals to 2 decimal places	Use all four operations to solve problems involving measure [length, mass, volume, money] using decimal notation, including scaling	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate
Perimeter, Area and Volume		Measure the perimeter of simple 2-D shapes	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. *Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. (Non-Statutory Guidance)* Find the area of rectilinear shapes by counting squares. *Relate area to arrays and multiplication (Non-Statutory Guidance)*	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. *Use the properties of rectangles to deduce related facts and find missing lengths and angles (Also in Geometry)*. *Calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths. Missing measures questions such as these can be expressed algebraically, for example 4 + 2b = 20 for a rectangle of sides 2 cm and b cm and perimeter of 20cm. (Non-Statutory Guidance)* Calculate and compare the area of rectangles (including squares), 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 capacity [for example, using water]	Recognise that shapes with the same areas can have different perimeters and vice versa. *Relate the area of rectangles to parallelograms and triangles, for example, by dissection, and calculate their areas, understanding and using the formulae (in words or symbols) to do this. (non-Statutory Guidance)* Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for area and volume of shapes. Calculate the volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]	

Every child deserves to be the best they can be

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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	Add and subtract amounts of money to give change, using both £ and p in practical contexts (Also in Calculations)	Estimate, compare and calculate different measures, including money in pounds and pence		
			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				
			Become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately. (Non-Statutory Guidance)	Become fluent in recognising the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. They record £ and p separately. The decimal recording of money is introduced formally in year 4. (Non-Statutory Guidance)			

Every child deserves to be the best they can be

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Comparing and Sequencing		Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	Compare and sequence intervals of time	Compare durations of events [for example, to calculate the time taken by particular events or tasks]			
		Recognise and use language relating to dates, including days of the week, weeks, months and years					
		Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later]					
Measure and Estimate		Measure and begin to record time (hours, minutes, seconds)		Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight		Use all four operations in problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days). (Non-Statutory Guidance)	
Telling the Time		Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	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 12-hour clocks, 24-hour clocks and using Roman Numerals from I to XII	Read, write and convert time between analogue and digital 12-hour and 24-hour clocks	Complete, read and interpret information in tables, including timetables	
		Use the language of time, including telling the time throughout the day, first using o'clock and then half past. (Non-statutory Guidance)	Become fluent in telling the time on analogue clocks and recording it. (Non-Statutory Guidance)	Use both analogue and digital 12-hour clocks and record their times. In this way they become fluent in and prepared for using digital 24-hour clocks in year 4. (Non-Statutory Guidance)			
Conversion			Know the number of minutes in an hour and the number of hours in a day	Know the number of seconds in a minute and the number of days in each month, year and leap year	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	

Every child deserves to be the best they can be

East Midlands Academy Trust
Maths Skill Progress Map – Geometry

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Identifying Shapes and their Properties	Recognise and name 2-D shapes [for example, rectangles (including squares), circles and triangles]	Identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	Identify lines of symmetry in 2-D shapes presented in different orientations *Draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape. (Non-Statutory Guidance)*	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius *Relationships might be expressed algebraically for example, d = 2 × r. (Non-Statutory Guidance)*
	Recognise and name 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	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, [for example, a circle on a cylinder and a triangle on a pyramid]			Identify 3-D shapes, including cubes and other cuboids, from 2-D representations *Use the properties of rectangles to deduce related facts and find missing lengths and angles (From Measures)*	Describe simple 3-D shapes
	Handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. (Non-Statutory Guidance)	*Handle and name a wide variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). Identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces. Read and write names for shapes that are appropriate for their word reading and spelling. (Non-Statutory Guidance)*	*Knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygons and polyhedra. Pupils extend their use of the properties of shapes. They should be able to describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle. (Non-Statutory Guidance)*	*Continue to classify shapes using geometrical properties, extending to classifying different triangles (for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, trapezium). (Non-Statutory Guidance)*	*Use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals, for example using dynamic geometry ICT tools. (Non-Statutory Guidance)*	*Describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements.(Non-Statutory Guidance)*
Drawing and Construction		*Draw lines and shapes using a straight edge. (non-Statutory Guidance)*	Draw 2-D shapes *Connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. (Non-Statutory Guidance)* Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	*Complete a simple symmetric figure with respect to a specific line of symmetry (From Position)*	*Become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor. They use conventional markings for parallel lines and right angles. (Non-Statutory Guidance)*	Draw 2-D shapes using given dimensions and angles *Draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles. (Non-Statutory Guidance)* Recognise and build simple 3-D shapes, including making nets
Comparing and Classifying	*Recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other. (Non-Statutory Guidance)*	Compare and sort common	2-D shapes and everyday objects 3-D shapes and everyday objects		Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	*Distinguish between regular and irregular polygons based on reasoning about equal sides and angles (Copied from Identifying Shapes and their Properties)*	Compare and classify geometric shapes based on their properties and sizes and 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 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle	Identify acute and obtuse angles and compare and order angles up to 2 right angles by size *Compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular. (Non-Statutory Guidance)*	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 1 whole turn (total 360°), • angles at a point on a straight line and half a turn (total 180°), • other multiples of 90° *Use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems. (Non-Statutory Guidance)*	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles *Relationships might be expressed algebraically for example; a = 180 – (b + c).(Non-Statutory Guidance)*

Every child deserves to be the best they can be

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Pattern	*Recognise and create repeating patterns with objects and with shapes (Non-Statutory Guidance)*	Order and arrange combinations of mathematical objects in patterns and sequences *Work with patterns of shapes, including those in different orientations (Non-Statutory Guidance)*				
Position, Direction and Movement	Describe position, direction and movement, including whole, half, quarter and three-quarter turns	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 three-quarter turns (clockwise and anti-clockwise)		Complete a simple symmetric figure with respect to a specific line of symmetry 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 4 quadrants) Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
	Make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face. (Non-Statutory Guidance) *Use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside. (Non-Statutory Guidance)*	*Use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles). (Non-Statutory Guidance)*		*Draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of coordinates, for example (2, 5), including using coordinate plotting ICT tools. (Non-Statutory Guidance)*	*Recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes. (Non-Statutory Guidance)*	*Draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers. (Non-Statutory Guidance)* *Draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to (a – 2, b + 3); (a, b) and (a + d, b + d) being opposite vertices of a square of side d. (Non-Statutory Guidance)*

Every child deserves to be the best they can be

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Interpreting, Construction and Presenting Data		Interpret and construct simple pictograms, tally charts, block diagrams and 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	Connect work on coordinates and scales to their interpretation of time graphs. (Non-Statutory Guidance)	Interpret and construct pie charts and line graphs and use these to solve problems
						Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects. (Non-Statutory Guidance)
						connect conversion from kilometres to miles in measurement to its graphical representation. (Non-Statutory Guidance)
		Record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10). (Non-Statutory Guidance)	Understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy. (Non-Statutory Guidance)	Understand and use a greater range of scales in their representations. (Non-Statutory Guidance)	Begin to decide which representations of data are most appropriate and why. (Non-Statutory Guidance)	Connect work on angles, fractions and percentages to the interpretation of pie charts. (Non-Statutory Guidance)
Averages						Calculate and interpret the mean as an average
						Know when it is appropriate to find the mean of a data set. (Non-Statutory Guidance)
Solving Problems		Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	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	
		Ask-and-answer questions about totalling and comparing categorical data	Continue to interpret data presented in many contexts. (Non-Statutory Guidance)	Begin to relate the graphical representation of data to recording change over time. (Non-Statutory Guidance)	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs (Yr4	

Every child deserves to be the best they can be

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Expressions and Equations	*Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 23 = ? – 4 (From Calculations)*	*Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems (From Calculations)*	*Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction (From Calculation)*		*Use the properties of rectangles to deduce related facts and find missing lengths and angles (From Measures)*	**Express missing number problems algebraically**
			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 (From Calculation)			*Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles (From Geometry)*
	Represent and use number bonds and related subtraction facts within 20 (From Calculations)					**Enumerate possibilities of combinations of 2 variables**
						Find pairs of numbers that satisfy an equation with 2 unknowns
						Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: • *missing numbers, lengths, coordinates and angles* • *formulae in mathematics and science* • *equivalent expressions (for example, a + b = b + a)* • *generalisations of number patterns* • *number puzzles (for example, what two numbers can add up to). (Non-Statutory Guidance)*
Formulae				*Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. (Non-Statutory Guidance)*		**Use simple formulae**
						Recognise when it is possible to use formulae for area and volume of shapes (From Measures)
						Draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to (a – 2, b + 3); (a, b) and (a + d, b + d) being opposite vertices of a square of side d. (Non-Statutory Guidance)
Sequences	*Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (From Measures)*	Sequence intervals of time (From Measures)			*Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule. (Non-Statutory Guidance)*	
		Order and arrange combinations of mathematical objects in patterns (From Position)				
	Count in multiples of 2s and 5s (From Number)	Count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward (From Number)	Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number (From Number)	Count in multiples of 6, 7, 9, 25 and 1,000 (From Calculations)	Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 (From Number)	**Generate and describe linear number sequences**
			Count up and down in tenths (From Fractions, Decimals, Percentages and Ratio)	Count up and down in hundredths (From Fractions, Decimals, Percentages and Ratio)	Recognise and describe linear number sequences (for example, 3, 3u1/2, 4, 4u1/2...), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add 1/2). (Non-Statutory Guidance)	

Every child deserves to be the best they can be