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TGA Maths Progression Document

This document has been written to ensure consistency and progression in the teaching of Mathematics throughout The Glapton Academy.

It reflects a whole school agreement.

The progression map is structured using the topic headings as they appear in the National Curriculum. These categories have been divided into sub-categories, shown as strands, to illustrate progression in key areas. This document is to be used alongside the DFE Non-Statutory Guidance to support teachers in understanding the essential knowledge children must have before progressing on to the next year group. Arrows have been added beneath some objectives to show where there is a direct correlation in progression in the RTP criteria. Objectives shown in red are taken directly from the DFE guidance, and those in bold are essential for preparing children to obtain the key objectives in red.

Beneath each of the unit blocks is a separate section illustrating progression in mathematical vocabulary. This begins within the Early Years Foundation Stage and progresses through KS1 and KS2 to the words that children would be expected to know and be able use in Year 6. These lists build upon one-another, it is therefore essential that teachers are familiar with the vocabulary of their own year groups, as well as those which proceed them.

These lists aim to help teachers identify key language for a topic and integrate their use into lesson plans. They aim to ensure that new vocabulary is introduced at the right time and that familiar words continue to be consolidated. When working on a particular unit, this vocabulary should be clearly displayed in classrooms so that children are reminded of the words which they need to know and use.

Maths Progression

Concept	F1	F2
Cardinality and Counting	- **Recites numbers in order to 10.** - **Knows that numbers identify how many objects are in a set.** - **Realises not only objects, but anything can be counted, including steps, claps or jumps.** - Shows an interest in numerals in the environment. - Shows an interest in representing numbers. - **Sometimes matches numeral and quantity correctly** - **Beginning to represent numbers using fingers, marks on paper or pictures**	- **Count forward to and beyond 20, pausing at each multiple of 10.** - **Play games that involve moving along a numbered track, and understand that larger numbers are further along the track** - Counts up to three or four objects by saying one number name for each item. - Counts actions or objects which cannot be moved. - Counts objects to 10, and beginning to count beyond 10. - Counts out up to six objects from a larger group. - Counts an irregular arrangement of up to ten objects. - Estimates how many objects they can see and checks by counting them. - **Understand the cardinal value of number words, for example understanding that 'four' relates to 4 objects.** - **Automatically show a given number using fingers.** - Recognises numerals 1 to 5. - Recognise some numerals of personal significance - Selects the correct numeral to represent 1 to 5, then 1 to 10 objects. - Records using marks they can interpret and explain
Vocabulary	*Zero, number, one, two, three … to twenty and beyond, none, how many?, more, less, same, odd, even, ones, tens, digit*	
Comparison	- Compares two groups of objects, saying when they have the same number.	- Uses the language of 'more' and 'fewer' to compare two sets of objects. - Finds one more or one less from a group of up to five objects, then ten objects. - Says the number that is one more than a given number
Vocabulary	*the same number as, as many as, more, larger, bigger, greater, fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third… twentieth, last, last but one, before, after, next, between*	
Composition	- **Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same.**	- **Begin to experience partitioning and combining numbers to 10.** - **Distribute items fairly, for example, put 3 marbles in each bag.**

	- Shows an interest in number problems.	- **Recognise when items are distributed unfairly.** - Finds the total number of items in two groups by counting all of them. - **Devise and record number stories, using pictures, numbers and symbols (such as arrows).** - In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.
Vocabulary	*add, more, and, make, sum, total, altogether, double, one more, two more … ten more, how many more to make …? how many more is … than …? how much more is …? take away, how many are left/left over? how many have gone? one less, two less, ten less … how many fewer is … than …? how much less is …?*	
Pattern		- Uses familiar objects and common shapes to create and recreate patterns and build models.
Vocabulary	*Pattern, recognise, describe, draw, what could we try next? how did you work it out? continue, copy, create, repeat, rule, error, correct, symmetrical pattern, repeating pattern*	
Shape and Space	- **Shows an interest in shape and space by playing with shapes or making arrangements with objects.** - **Uses shapes appropriately for tasks.** - Uses positional language.	- **See, explore and discuss models of common 2D and 3D shapes with varied dimensions and presented in different orientations** - Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. - Selects a particular named shape. - Can describe their relative position such as 'behind' or 'next to'.
Vocabulary	*shape, pattern flat curved, straight round hollow, solid sort make, build, draw size, match 2-D shape corner, side rectangle (including square) circle triangle 3-D shape face, edge, vertex, vertices, cube, pyramid, sphere, cone* *position over, under, above, below top, bottom, side on, in outside, inside around in front, behind front, back beside, next to opposite apart between middle, edge, corner, direction, left, right up, down forwards, backwards, sideways across next to, close, near, far along through to, from, towards, away from movement slide roll turn stretch, bend whole turn, half turn*	
Measures	- Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'.	- Orders two or three items by length or height. - Uses everyday language related to time. - Orders and sequences familiar events. - Measures short periods of time in simple ways.
Vocabulary	*Measure, size, compare, guess, estimate enough, not enough too much, too little too many, too few nearly, close to, about the same as just over, just under* *Metre length, height, width, depth long, short, tall high, low wide, narrow thick, thin longer, shorter, taller, higher … and so on longest, shortest, tallest, highest … and so on far, near, close* *Weigh, weighs, balances heavy, light heavier than, lighter than heaviest, lightest scales Capacity and volume full empty half full holds container*	

	Time, days of the week, Monday, Tuesday … day, week birthday, holiday morning, afternoon, evening, night bedtime, dinner time, playtime today, yesterday, tomorrow before, after next, last now, soon, early, late quick, quicker, quickest, quickly slow, slower, slowest, slowly old, older, oldest new, newer, newest takes longer, takes less time hour, o'clock clock, watch, hands *Money, coin, penny, pence, pound price, cost buy, sell spend, spent pay*

Maths Progression

Concept	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Number and Place Value			
Counting	**Count forwards to** and across **100, beginning at zero.** **Count backwards from any number below 100.** **Count forwards and backwards in multiples of two, five and ten, up to 10 multiples, beginning with any multiple.** Count in steps of $\frac{1}{2}$	**Count in multiples of two, five from zero, and in tens from any number forwards and backwards.** Count in fractions up to ten, starting from any number, using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (for example, 1 1/4 , 1 2/4 (or 1 1/2), 1 3/4 , 2).	**Count from zero in multiples of three, four, eight, fifty and one hundred.** Count up and down in tenths and 0.1	**Count in multiples of six, seven, nine, twenty-five and one thousand.** Count up and down in hundredths and 0.01 Count backward 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 Count forwards and backwards with positive and negative whole numbers, including through zero	Count forwards and backwards in a range of fractional steps Use negative numbers in a context and calculate intervals across zero.
Reading and Writing Numbers	Read and write numbers to 100 in numerals. Read and write numbers from 1 to 20 in numerals and words.	Read and write numbers to at least 100 in numerals and words.	Read and write numbers to 1,000 in numerals and words Read and write numbers with one decimal place.	Read and write numbers to 10,000 in numerals and words Read and write numbers with two decimal places	Read and write numbers to at least 1,000,000 Read and write numbers with up to three decimal places	Read and write numbers to at least 10,000,000 Read and write numbers with up to three decimal places
Comparing and Ordering	Use the language of: equal to, more than, less than (fewer), most, least **Reason about the location of numbers to 20 in the linear number system;** **Compare numbers using < > and =** →	Order and compare numbers up to 100 using <, > and = signs **Reason about the location of any 2-digit number in the linear number system** →	Order and compare numbers to 1000 **Reason about the location of any 3-digit number in the linear number system** →	Order and compare numbers beyond 1000 **Reason about the location of any 4-digit number in the linear number system** →	Order and compare numbers to at least 1,000,000 **Reason about the location of any number with up to 2 decimal places in the linear number system** →	Order and compare numbers to at least 10,000,000 **Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system** →

				Compare numbers with the same number of decimal places up to 2 decimal places		
Understanding Place Value	**Know 10 ones are equivalent to 1 ten.** **Know that multiples of 10 are made up from a number of tens**	**Know that 10 ones are equivalent to 1 ten, and that 40 (for example) can be composed from 40 ones or 4 tens.** **Know how many tens there are in multiples of 10 up to 00.**	**Know that 10 tens are equivalent to 1 hundred and that 100 is 10 times the size of 10;** **Apply this to identify and work out how many 10s there are in other 3-digit multiples of 10** →	**Know that 10 hundreds are equivalent to 1 thousand and that 1000 is 10 times the size of 100;** **Apply this to identify and work out how many 100s there are in other 4-digit multiples of 100** →	**Know that 10 tenths are equivalent to 1 one and that 1 is 10 times the size of 0.1;** **Know that 100 hundredths are equivalent to 1 one and that 1 is 100 times the size of 0.01;** **Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01** →	**Understand the relationship between powers of 10 from 1 hundredth to 10 million and use this to make a given number 10, 100, 100, 1 tenth, 1 hundredth or 1 thousandth times the size.**
	Recognise the place value of each digit in a number beyond 20, supported by objects and pictorial representations including a number line.	**Recognise the place value of each digit in a two-digit number (tens, ones);** **Compose and decompose 2-digit numbers using standard and non-standard partitioning** →	**Recognise and understand the place value of each digit in a 3-digit number (hundreds, tens, ones);** **Compose and decompose 3-digit numbers using standard and non-standard partitioning** →	**Recognise and understand the place value of each digit in a 4-digit number** and to one decimal place; **Compose and decompose 4-digit numbers using standard and non-standard partitioning** →	**Recognise and understand the place value of each digit in numbers with up to 2 decimal places;** **Compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning** →	**Recognise and understand the place value of each digit in numbers up to 10 million, including decimal fractions;** **Compose and decompose numbers up to 10 million using standard and non-standard partitioning**, including decimal fractions
	Use number lines, objects and pictures to identify and represent numbers up to 20	Identify, represent and estimate numbers to 100 using different representations, including the number line	Identify, represent and estimate numbers to 1,000 using different representations	Identify, represent and estimate numbers to 10,000 using different representations	Identify, represent and estimate numbers to 1,000,000 using different representations	

			Divide 100 into 2, 4, 5 and 10 equal parts; Read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts **→** **Apply place value knowledge to known additive and multiplicative number facts (scaling facts by 10)** **→**	**Divide 1000 into 2, 4, 5 and 10 equal parts; Read scales/number lines marked in multiples of 1000 with 2, 4, 5 and 10 equal parts** **→** **Apply place value knowledge to known additive and multiplicative number facts (scaling facts by 100)** **→**	**Divide 1 into 2, 4, 5 and 10 equal parts; Read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts** **→** **Apply place value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth)**	**Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts; Read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts**
More or Less	Given a number, identify one more and one less.	Find 10 more or less than a given number.	Find 10 or 100 more or less than a given number.	Find 1000 more or less than any given number.	Find 0.1 and 0.01 more or less than a given number.	Find 0.1, 0.01 and 0.001 more or less than a given number.
Rounding	**Identify which numbers are closest to… e.g, 20**	**Identify the previous and next multiple of 10** **→** **Round numbers to the nearest 10**	**Identify the previous and next multiple of 100 and 10** **→** **Round numbers to the nearest 10 or 100**	**Identify the previous and next multiple of 1000 and 100** **→** **Round any number to the nearest 100 or 1000** **→** Round decimals with one decimal place to the nearest whole number. Use rounding to support estimation	**Identify the previous and next multiple of 1 and 0.1** **→** **Round to the nearest 1 and 0.1** **→** **Round any number up to 1 000 000 to the nearest 10, 100, 1,000, 10,000 and 100,000**	**Round any number to a required degree of accuracy, including in contexts**
Roman Numerals			Read Roman numerals to 12 (XII) (linked to time)	Read Roman numbers to 100 (put into historical contexts)	Read Roman numerals to 1000 (M) and recognise	

					years written in Roman numerals	
Problem Solving		Use place value and number facts to solve problems.	Solve number problems and practical problems involving numbers up to 1000	Solve word problems involving all of the above and increasingly large positive numbers	Solve number and practical problems that involve all of the above	Solve number and practical problems that involve all of the above
Vocabulary	*Numeral, twenty-one, twenty-two … one hundred, ones, tens, forwards, backwards, equal to, equivalent to, most, least, many, multiple of, half-way between*	*Two hundred, three hundred…, one thousand, sequence, continue, predict, > greater than, < less than, hundreds, one-, two- or three-digit number, place, place value, stands for, represents, exchange, exact, exactly*	*Factor of, relationship, Roman numerals, one hundred more, one hundred less, approximate, approximately, round, nearest, round to the nearest ten/ hundred round up, round down*	*Ten thousand, hundred thousand, million, next, consecutive, integer, positive, negative, above/below zero, negative numbers, round to the nearest thousand*	*Factor pair, formula, divisibility, square number, prime number, ascending/descending order, round to the nearest thousand*	*Factorise, prime factor, digit total*

Addition and Subtraction						
Fluency	**Develop fluency in addition and subtraction facts within 10** → Represent and use number bonds and related subtraction facts within 20	**Secure fluency in addition and subtraction facts within 10, through continued practise** → Recall and use addition and subtraction facts to 20 fluently and use related facts up to 100.	**Secure fluency in addition and subtraction facts that bridge 10, through continued practise** Recall and use addition and subtraction facts to 100.	Recall and use addition and subtraction facts to 1000.	Add and subtract numbers mentally with increasingly larger numbers.	
Addition and Subtraction Calculations	**Compose numbers to 10 from 2 parts; Partition numbers to 10 into parts, including odd and even numbers**	**Add and subtract across 10**	**Calculate complements to 100**		**Manipulate additive and multiplicative equations, including applying understanding of the inverse relationship**	**Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and**

	Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs Add and subtract one-digit and two-digit numbers to 20, including zero. Realise the effect of adding or subtracting 0	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: • 2d + 1s • 2d + 10s • 2d + 2d • 1d + 1d + 1d Begin to record addition and subtraction in columns. **Recognise the subtraction structure of 'difference' and answer questions of the form, 'How many more?'** **Add and subtract within 100 by applying related 1-digit addition and subtraction facts: add subtract only ones or only tens to/from a 2-digit number**	**Add and subtract numbers with up to three digits, using columnar methods, including exchanging** Add and subtract numbers mentally including: • 3d + 1s • 3d + 10s • 3d + 100s **Understand the inverse relationship between addition and subtraction and how both relate to the part-part-whole structure;** **Understand and use the commutative property of addition, and understand the related property for subtraction**	Add and subtract numbers with up to 4 digits and decimals with up to 2 decimal places using the formal method of columnar addition and subtraction where appropriate, including exchanging. Derive and use addition and subtraction facts for 1 and 10, up to 1 decimal place	**between addition and subtraction and the commutative property of addition and multiplication** Add and subtract numbers with more than 4 digits and decimals with up to 2 decimal places using the formal method of columnar addition and subtraction where appropriate, including exchanging. Derive and use addition and subtraction facts for 1 to 10, up to 1 decimal place.	**multiplicative relationships** **Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place value understanding** Add and subtract numbers with more than 4 digits and decimals with up to 3 decimal places using the formal method of columnar addition and subtraction where appropriate, including exchanging. **Solve problems involving ratio relationships**

		Add and subtract within 100 by applying related 1-digit addition and subtraction facts; Add and subtract any two 2-digit numbers				**Solve problems with 2 unknowns**
Estimating and Checking Answers	Recognise the inverse relationship between addition and subtraction.	Recognise that subtraction is the inverse of addition and use for checking calculations Use estimation to check answers to calculations are reasonable (e.g. knowing 48 + 35 will be less than 100)	**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, inverse and rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Use estimation, inverse and rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
Problem Solving	**Relate additive expressions and equations to real-life contexts** Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations if needed. I can solve missing number problems, using objects and pictures if needed.	**Use the inverse to solve missing number problems.** Solve problems involving addition and subtraction using concrete and pictorial, including 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
Vocabulary	*Addition, subtract, equals, is the same as, number bonds, missing number*	*One hundred more, one hundred less, tens boundary*	*Hundreds boundary*	*Inverse*	*Ones boundary, tenths boundary*	

Multiplication and Division						
Fluency	Count forwards and backwards in multiples of two, five and ten, up to 10 multiples, beginning with any multiple. →	Calculate products within the 2, 5 and 10 multiplication tables.	Recall multiplication facts and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables; Recognise products in the above multiplication tables as multiples of the corresponding number →	Recall multiplication and division facts up to 12x12; Recognise products in multiplication tables as multiples of the corresponding number →	Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	
Understanding Multiplication and Division	Show an understanding of multiplication by grouping objects Show an understanding of division by grouping and sharing objects	Understand multiplication as arrays and repeated addition Understand division as grouping and sharing quantities and that a division calculation can have a remainder Show that multiplication is commutative and division is not Use commutativity and inverse relations to develop multiplicative reasoning Relate division to fractions	Understand that division is the inverse of multiplication and vice-versa. Develop understanding of families of facts.	Understand and apply the distributive property of multiplication. → Secure understanding of families of facts.	Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	Use knowledge of the order of operations to carry out calculations involving the four operations.
Multiplication and Division Calculations	Count in multiples of two, five and ten and make connections	Recognise repeated addition contexts, representing them with	Apply known multiplication and division facts to solve	Multiply and divide whole numbers by 10 and 100, and	Multiply and divide numbers by 10 and 100, and understand	Understand that 2 numbers can be related additively or

	between arrays, number patterns and counting.	**multiplication equations and calculating the product** Connect the 10 multiplication table to place value and the five times-tables to the divisions on a clock face Calculate mathematical statements for multiplication and division within the multiplication tables I know. Write calculations using the multiplication, division and equals signs.	**contextual problems with different structures, including quotitive and partitive division.** Derive new facts using known multiplication facts. E.g. 3x2=6 so 30x2=60 Write and calculate mathematical statements for multiplication and division, using the multiplication tables I know **Calculate 2-digit numbers multiplied by a 1-digit number using mental methods and jottings and progressing to formal written methods** **Develop understanding of division by solving 2-digit ÷ 1 using**	**understand this as equivalent to making a number 10 times or 100 times the size** → 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 **Understand and apply the distributive property of multiplication** → **Multiply numbers up to 3 digit numbers by a 1 digit number using the formal written method of short multiplication** **Solve division problems, with 2-digit dividends and 1-digid divisors,**	**this as equivalent to making a number 10 times or 100 times the size, or 1 tenth or 1 hundredth times the size** Multiply and divide numbers mentally drawing upon known facts **Multiply any whole number with up to 4 digits by any 1-digit number using a formal written method** **Divide a number with up to 4 digits by a 1-digit number using a**	**multiplicatively, and quantify additive and multiplicative relationships** **Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place value understanding** Perform mental calculations, including with mixed operations and large numbers Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication Multiply 1-digit numbers with up to 2 decimal places by whole numbers Divide numbers up to 4 digits by a two-digit number using the formal

			mental methods and jottings	**that involve remainders, and interpret remainders appropriately according to the context** **Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication**	**formal written method, and interpret remainders appropriately for the context** **Manipulate additive and multiplicative equations, including applying understanding of the inverse relationship between addition and subtraction and the commutative property of addition and multiplication**	written method of short division where appropriate, interpreting remainders according to 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
Doubling and Halving	Recall and use doubles of numbers to 20 and corresponding halves.	Recall and use doubles of numbers to 50. Recall and use halves of 2-digit even numbers to 50 Double multiples of 10 to 100 and find the corresponding halves. Double multiples of 5 to 50 and find the corresponding halves	Recall and use doubles of all multiples to 100 and corresponding halves. Double multiples of 10 and 100 to 1000 Develop doubling strategies linked to times-tables	Double and halve any 3-digit number by partitioning Double any decimal to 1 decimal place Develop doubling strategies linked to times-tables	Double and halve any decimal to 1 decimal place. Develop doubling and halving strategies linked to times-tables	Double and halve any number, including decimals Develop doubling and halving strategies linked to times-tables
Properties of Numbers				**Recognise and use factor pairs and commutativity in mental calculations**	**Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a**	Identify common factors, common multiples and prime numbers. Relate common factors to finding equivalent fractions.

					product of 2 or 3 factors Know and use vocabulary of prime numbers, prime factors and composite (nonprime) numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square number and cube numbers and the notation for both.	
Multiplication and Division Problems	**I can solve one-step problems involving ÷ and x, using objects, pictures and arrays to help me.**	Solve problems involving multiplication and division in a context, in different ways. E.g. number line, equipment, arrays **Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor and to division equations**	Solve missing number problems involving multiplication and division. Solve problems involving positive integer scaling problems and correspondence problems in which n objects are connected to m objects	Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. Solve problems involving multiplying and adding, including using the distributive law to multiply 2-digit numbers by 1-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, 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.**	Solve problems involving addition, subtraction, multiplication and division. **Solve problems involving ratio relationships** **Solve problems with 2 unknowns**

Vocabulary	*Multiplication, multiply, multiplied by, multiple, division, dividing, sharing, grouping, array, doubling, halving*	*groups of, times, once, twice, three times … ten times, repeated addition, divide, divided by, divided into, share, share equally, left, left over, one each two each three each…, equal groups of, row, column, multiplication table multiplication fact, division fact*	*Factor, product, remainder*	*Inverse, square, squared, cube, cubed,*		

Fractions including Decimals and Percentages						
Recognise, Write and Find Fractions	Find half of an object, shape or quantity. Find a quarter of an object, shape or quantity. **I can explain that halves are two equal parts and quarters are four equal parts of the whole.**	**Recognise, find, name and write fractions 1/3, 1/4, 2/4 (1/2) and 3/4 of a length, shape, set of objects or quantity** **Recognise the equivalence of 1/2 and 2/4**	**Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts** **Find unit fractions of quantities using known division facts** and non-unit fractions with small denominators → **Recognise and show, using diagrams, equivalent fractions with small denominators**	**Use unit fractions as the basis to understand non-unit fractions, improper fractions and mixed numbers, for example: 2/5 is 2 one-fifths** Recognise, find and write fractions of a discrete set of objects, including measures and shapes; unit fractions and non-unit fractions with small denominators **Recognise and show, using diagrams, families of common equivalent fractions**	**Find non-unit fractions of quantities** **Find equivalent fractions and understand that they**	**Recognise when fractions can be simplified, and use common factors to simplify fractions**

				Write an equivalent fraction of a fraction given the denominator or numerator **Convert mixed numbers to improper fractions and vice versa**	**have the same value and the same position in the linear number system** **Recognise mixed numbers and improper fractions and convert from one form to the other**	
Compare and Order Fractions		Compare and order $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{2}$	**Reason about the location of any fraction within 1 in the linear number system** → Compare and order fractions with the same denominator. Compare and order unit fractions	**Reason about the location of mixed numbers in the linear number system** Compare and order unit fractions and fractions with the same denominator	**Find equivalent fractions and understand that they have the same value and the same position in the linear number system** Compare and order fractions whose denominations are all multiples of the same number	**Express fractions in a common denomination and use this to compare fractions that are similar in value** **Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy**
Calculating with Fractions		Add and subtract $\frac{1}{4}$ and $\frac{1}{2}$ from a given number to 10 (link to counting)	**Add and subtract fractions with the same denominator within 1 whole** →	**Add and subtract improper and mixed number fractions with the same denominator, including bridging whole numbers**	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 using the concept of equivalent fractions, and mixed numbers Multiply simple pairs of proper fractions, writing the answer in its simplest form

						Divide proper fractions by whole numbers
Solving Problems Involving Fractions			Solve problems that involve all of the above	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		
Recognise and Write Decimals				Recognise and write decimal equivalents of 1/2, 1/4 and $\frac{3}{4}$ Recognise and write decimal equivalents of any number of tenths or hundredths	Read and write decimal numbers as fractions (e.g. 0.71 = 71/100) Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	Identify the value of each digit in numbers given to three decimal places
Compare Decimals (Also see rounding)				Compare numbers with the same number of decimal places up to two decimal places	Read, write, order and compare numbers with up to three decimal places	
Calculating and Problem Solving with Decimals				Find the effect of dividing a 1- or 2-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	Solve problems involving numbers up to three decimal places.	Multiply one-digit numbers with up to two decimal places by whole numbers Use written division methods in cases where the answer has up to two decimal places Solve problems which require answers to be rounded to specified degrees of accuracy

Fraction, Decimal and Percentage Equivalence				Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 Solve simple measure and money problems involving fractions and decimals to two decimal places Pupils should connect hundredths and tenths to place value and decimal measure	**Recall decimal equivalents for 1/2 , 1/4 , 1/5 and 1/10 and for multiples of these proper fractions** Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100, and as a decimal. Solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25	Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Vocabulary	*Fraction, equal part, equal grouping, equal sharing, half, quarter, parts of a whole, one of two equal parts, one of four equal parts*	*Equivalent fraction, mixed number, numerator, denominator, two halves, two quarters, three quarters, one third, two thirds, one of three equal parts*	*Sixths, sevenths, eighths, tenths …*	*Hundredths, decimal, decimal fraction, decimal point, decimal place, decimal equivalent,*	*Proper/improper fraction, equivalent, reduced to, cancel, thousandths*	

Ratio and Proportion						
Ratio and Proportion						**Solve problems involving ratio relationships** Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison Solve problems involving similar shapes where the scale factor is known or can be found Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
Vocabulary						*In every, for every percentage, per cent, %, ratio*

Algebra						
Algebra	I can solve missing number problems, using objects and pictures if needed. (Copied from Addition and Subtraction)	Use the inverse to solve missing number problems. (Copied from Addition and Subtraction)	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction (Copied from Addition and Subtraction)		Use the properties of rectangles to deduce related facts and find missing lengths and angles (Copied from Geometry: Properties of Shapes)	**Solve problems with 2 unknowns** Use simple formulae to solve problems 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.
Vocabulary						*Formulae, equation, unknown, variable*

Measurement						
Using Measures	Measure and begin to record lengths and heights Measure and begin to record mass/weight Measure and begin to record capacity/volume	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, scales,	**Measure and compare: lengths (m/cm/mm); mass (kg, g); volume and capacity (l/ ml)** Add and subtract: lengths (m/cm/mm); mass (kg, g); volume and capacity (l/ ml)	Estimate, calculate and compare different measures Use decimal notation to to record metric measures. E.g. kilograms, kilometres, metres, litres, pounds and pence	**Convert between different units of metric measure, including using common decimals and fractions** Understand and use approximate equivalences between metric and common	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

	Measure and begin to record time (hours, minutes, seconds) Compare or describe lengths, weights and volumes e.g. longer, heavier, half-full Compare or describe time e.g. quicker, slower, earlier, later	thermometers and measuring vessels Compare and order lengths, mass, volume/capacity and record the results using >, < and = Read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers and given		Convert between different units of measure e.g. km to m; m to cm; cm to mm; kg to g; l to ml; hour to min; min to sec; year to month; week to days	imperial units such as inches, pounds and pints Use all four operations to solve problems involving measure (for example, length, mass, volume) using decimal notation, including scaling	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
Vocabulary	*Measurement, guess, estimate, roughly, metre, centimetre, length, height, width, depth, ruler, metre stick, kilogram, half kilogram, scales, litre, half litre, capacity, volume, more than, less than, quarter full*	*Measuring scale, further, furthest, tape measure, gram, millilitre, contains, temperature, degree*	*Division, approximately, millimetre, kilometre, mile, distance apart … between … to … from, Perimeter, centigrade*	*Unit, standard unit, metric unit, breadth, mass: big, bigger, small, smaller* *weight: heavy/light, heavier/lighter, heaviest/lightest measuring cylinder*	*Imperial unit, pint, gallon*	*Yard, foot, feet, inch, inches, tonne, pound, ounce, centilitre, cubic centimetres (cm3), cubic metres (m3), cubic millimetres (mm3), cubic kilometres (km3)*
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 amount of money Solve simple problems in a practical context involving addition and subtraction of money of	Add and subtract amounts of money to give change, using both £ and p in practical contexts	Estimate, compare and calculate different measures, including money in pounds and pence	Use all four operations to solve problems	

		the same unit, including giving change				
Vocabulary	*Change, costs more cheap, costs less, cheaper, costs the same as, how much …? how many …? total*	*Bought, sold*			*Discount, currency*	*Profit, loss*
Time	Sequence events in chronological order using language e.g. before, after, next, first, today, yesterday, tomorrow, morning, afternoon and evening Recognise and use language relating to dates, including days of the week, weeks, months and years Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	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 Know the number of minutes in an hour and number of hours in a day	Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight Estimate and read time with increasing accuracy to the nearest minute Tell and write the time from 12 and 24 hour clocks Tell and write the time from an analogue clock, using Roman numerals 1 to X11, and 12 hour & 24 hour clocks Record and compare time and duration of events in terms of seconds, minutes and hours Know the number of seconds in a minute and the number of days in each month, year and leap year	Read, write and convert time between analogue and digital 12- and 24-hour clocks Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Solve problems involving converting between units of time	Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa

Vocabulary	*Months of the year, seasons, weekend, month, year, earlier, later, first, midnight, date, how long ago? how long will it be to …? how long will it take to …? how often? always, never, often, sometimes usually, once, twice hour, o'clock, half past, quarter past, quarter to clock, clock face, watch, hands, hour hand, minute hand, hours, minutes*	*fortnight, 5, 10, 15 … minutes past, digital/analogue, clock/watch, timer, seconds*	*Century, calendar, earliest, latest, a.m., p.m., Roman numerals, 12-hour clock time, 24-hour clock time*	*Leap year, millennium, noon, date of birth, timetable, arrive, depart*		*Greenwich Mean Time, British Summer Time, International Date Line*
Perimeter, Area and Volume			Measure the perimeter of simple 2D shapes	**Find the perimeter of regular and irregular polygons.** Find the area of a rectilinear shape by counting squares; Relate the area to arrays and multiplication	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres **Compare areas and calculate the area of rectangles (including squares) using standard units** Estimate volume [for example, using 1cm3 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 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
Vocabulary			*Perimeter, edge*	*Area, covers, square centimetre (cm2)*	*Square metre (m2), square millimetre (mm2)*	

Geometry						
2D Shapes	**Recognise common 2D and 3D shapes presented in different orientations and know that rectangles, triangles cuboids and pyramids are not always similar to one another** → **Compose 2D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.** →	**Use precise language to describe properties of 2D shapes, and compare shapes by reasoning about similarities and differences in properties** → Identify 2-D shapes on the surface of 3-D shapes. E.g. a circle on a cylinder and a triangle on a pyramid Compare and sort common 2D shapes and everyday objects	**Recognise right angles as a property of shape and identify right angles in 2D shapes presented in different orientations** **Draw polygons by joining marked points, and identify parallel and perpendicular sides** →	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes **Identify line symmetry in 2D shapes presented in different orientations.** **Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal.** **Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.** →	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles Use the properties of rectangles to deduce related facts and find missing lengths and angles	**Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems** Compare and classify geometric shapes based on their properties and sizes Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius **Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems**
3D Shapes	**Recognise common 2D and 3D shapes presented in different orientations and know that rectangles, triangles cuboids and pyramids are not always similar to one another**	**Use precise language to describe properties of 3D shapes, and compare shapes by reasoning about similarities and differences in properties**	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

	Compose 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.	Recognise and name common 3-D shapes Identify and describe properties of 3D shapes, including the number of edges, vertices and faces Compare and sort common 3D shapes and everyday objects				
Vocabulary	*Point, pointed, cuboid, cylinder*	*Surface, line of symmetry, rectangular, circle, circular, triangle, triangular, pentagon, hexagon, octagon*	*pentagonal, hexagonal, octagonal, quadrilateral right-angled, parallel, perpendicular, hemisphere, prism, triangular prism*	*Line, construct, sketch, centre, angle, right-angled, base, square-based, regular, irregular, 2D, two-dimensional, oblong, rectilinear, equilateral triangle, isosceles triangle, scalene triangle, heptagon, parallelogram, rhombus, trapezium, polygon, 3-D, three-dimensional, spherical, cylindrical, tetrahedron, polyhedron*	*Congruent, octahedron*	*Radius, diameter, circumference, intersecting, intersection plane, kite*
Angles and Lines			**Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations** and know that 2 and 4 right angles make half and a full turn respectively	I can identify acute and obtuse angles and order by size **Identify line symmetry in 2D shapes presented in different orientations.** **Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with**	**Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.** Know angles are measured in degrees: Estimate and compare acute, obtuse and reflex angles using 'degrees'	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

			Identify whether angles are greater or less than a right angle **Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.**	**respect to a specified line of symmetry.**	Draw given angles, and measure them in degrees (o) including acute, obtuse and reflex 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°	
Vocabulary			*Straight line, horizontal, vertical, diagonal, angle … is a greater/smaller angle than…, right angle, acute angle, obtuse angle,*	*Degree, ruler, angle measurer, compass*	*Protractor, reflex*	
Position and Direction	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 three-quarter turns (clockwise and anti-clockwise)		**Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.** 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

Vocabulary	*Underneath, centre, journey, quarter turn, three-quarter turn*	*Route, higher, lower, clockwise, anti-clockwise, right angle, straight line*	*Compass point north, south, east, west, N, S, E, W horizontal, vertical, diagonal*	*North-east, north-west, south-east, south-west, NE, NW, SE, SW, translate, translation, rotate, rotation, reflection, reflect*	*Axis of symmetry, reflective symmetry, x-axis, y-axis, quadrant, coordinate*	

Statistics						
Present and Interpret		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 and use these to solve problems
Solve problems		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. E.g. '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	Calculate and interpret the mean as average
Vocabulary	*count, sort, vote, group, set list, table*	*Tally, graph, block graph, pictogram, represent, group, set list, table, label, title most popular, most common, least popular, least common*	*Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes diagram*	*Survey, questionnaire, data*	*Database, line graph, maximum/minimum value, outcome*	*Pie chart, mean (mode, median, range as estimates for this) statistics, distribution*

Additional General Vocabulary	*problem, problem solving, mental, mentally, what could we try next? how did you work it out? explain your thinking, recognise, describe*	*Show how you…, explain your method, describe the pattern, describe the rule, investigate, mental calculation, written calculation*	*Greatest value, least value, statement*	*Justify, make a statement*	*Explain you reasoning*	