ST CHARLES' CATHOLIC PRIMARY SCHOOL

MATHS PROGRESSION OF DISCIPLINARY KNOWLEDGE AND VOCABULARY

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
NUMBER AND PLACE VALUE	COUNTING						
	Count objects, actions and sounds Count beyond ten.	To count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. To identify one more and one less than a given number. To count in multiples of twos, fives and tens from different multiples to develop their recognition of patterns in the number system, including varied and frequent practice through increasingly complex questions. To recognise and create repeating patterns with objects and with shapes.	To count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward.	*To continue to count in ones, tens and hundreds, so that pupils become fluent in the order and place value of numbers to 1000.* *To count from 0 in multiples of 4, 8, 50 and 100.*	*To count in tens and hundreds, and maintain fluency in other multiples through varied and frequent practice.* *To count in multiples of 6, 7, 9, 25 and 1000.* *To count backwards through zero to include negative numbers.* *To find 1000 more or less than a given number.*	To count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. To interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.	
	IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS						
	Subitise.						

	Link the number symbol (numeral) with its cardinal number value.						
READING AND WRITING NUMBERS							
	Link the number symbol (numeral) with its cardinal number value.	To read and write numbers from 1 to 20 in numerals and words. To count, read and write numbers to 100 in numerals.	To read and write numbers to at least 100 in numerals and in words.	To read and write numbers up to 1000 in numerals and in words.		To read and write numbers to at least 1 000 000 and determine the value of each digit.	To *say,* read and write, numbers up to 10 000 000 *accurately* and determine the value of each digit.
COMPARING AND ORDERING NUMBERS							
	Compare numbers. Understand the 'one more than/one less than' relationship between consecutive numbers.		To compare and order numbers from 0 up to 100; use <, > and = signs.	To compare and order numbers up to 1000.	To order and compare numbers beyond 1000.	To order and compare numbers to at least 1 000 000 and determine the value of each digit.	To order and compare numbers up to 10 000 000 *accurately* and determine the value of each digit.
UNDERSTANDING PLACE VALUE							
	Understand the 'one more than/one less than' relationship between consecutive numbers. Explore the composition of numbers to10.		To recognise the place value of each digit in a two-digit number (tens, ones) to *become fluent and apply their knowledge of numbers to reason with, discuss and solve problems. To begin to understand zero as a place holder.*	To recognise the place value of each digit in a three-digit number (hundreds, tens, ones) *and apply partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, 146 = 100 + 40 and 6, 146 = 130 + 16).*	To recognise the place value of each digit in a four-digit number. *To begin to extend their knowledge of the number system to include the decimal numbers and fractions that they have met so far.*	*To extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far.*	To use negative numbers in context, and calculate intervals across zero.
ROUNDING							
				To round any number to the	To round any number up to 1 000	To round any whole number to a	To round any number to the

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
				nearest 10, 100 or 1000. *To connect estimation and rounding numbers to the use of measuring instruments.*	000 to the nearest 10, 100, 1000, 10 000 and 100 000.	required degree of accuracy.	nearest 10, 100 or 1000. *To connect estimation and rounding numbers to the use of measuring instruments.*
	ROMAN NUMERALS						
					To read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	To read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
	SOLVE PROBLEMS						
	Solve real world mathematical problems with numbers up to 5. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'	*To practise ordinal numbers and solve simple concrete problems.*	To use place value and number facts to solve *related* problems *to develop fluency*.	To solve number problems and practical problems involving these ideas.	To solve number and practical problems that involve all of the above and with increasingly large positive numbers.	To solve number problems and practical problems that involve all of the above.	To solve number and practical problems that involve all of the above.
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
ADDITION AND SUBTRACTION	**MENTAL CALCULATIONS**						
	Subitise. Explore the composition of numbers to 10. Automatically recall number bonds 0-5 and some to 10	To add and subtract one-digit and two-digit numbers to 20, including zero. *To realise the effect of adding or subtracting zero.*	*To extend the language of addition and subtraction to include sum and difference.* To show that addition of two numbers can be done in any order (commutative) and	To add and subtract numbers mentally, including: *two-digit numbers, where the answers could exceed 100,* a three-digit number and ones, a three-digit number and tens and a three-digit	*To continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency.*	To add and subtract numbers mentally with increasingly large numbers.	To perform mental calculations, including with mixed operations and large numbers.

			subtraction of one number from another cannot. To add and subtract numbers using an efficient strategy, explaining their method verbally using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, add three one-digit numbers.	number and hundreds.		
	NUMBER BONDS					
	Subitise. Explore the composition of numbers to 10. Automatically recall number bonds 0-5 and some to 10.	To *memorise*, represent and use number bonds and related subtraction facts within 20.	To recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships. To recall and use addition and subtraction facts to 20 *to become fluent in deriving associative facts (e.g. 10 – 7 = 3, 100 – 70 = 30)* and derive and use related facts up to 100.			

WRITTEN CALCULATIONS

	To read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs.	*To begin to record addition and subtraction in columns to support place value and prepare for formal written methods with larger numbers.*	*To use the understanding of place value and partitioning to enable adding and subtracting numbers with up to three digits, using formal written methods of columnar addition and subtraction to become fluent.*	To add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate.	To add and subtract whole numbers with more than four digits, including using formal written methods of columnar addition and subtraction fluently.	

INVERSE OPERATIONS, ESTIMATION AND CHECKING ANSWERS

Explore the composition of numbers to 10.		To recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	To estimate the answer to a calculation and use inverse operations to check answers.	To estimate and use inverse operations to check answers to a calculation.	To use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.	*To 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.*

ORDER OF OPERATIONS

						To use their knowledge of the order of operations to carry out calculations involving the four operations.

SOLVE PROBLEMS

	To *discuss* and solve one-step problems *(in familiar practical contexts)* that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems. *Problems*	To solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of				

		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 enable to use these operations flexibly.	mental and written methods.			
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
MULTIPLICATION AND DIVISION	MENTAL CALCULATIONS					
	Explore the composition of numbers to 10.		To begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. To begin to relate multiplication and division facts to fractions and measures (e.g., 40 ÷ 2 = 20, 20 is a half of 40). To show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot, to develop multiplicative reasoning.	To 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 efficient mental methods, for example, using commutativity and associativity, and progressing to formal reliable written methods of short multiplication and division.	To combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations, e.g. 2 x 6 x 5 = 10 x 6 = 60. To practise mental methods and extend this to three-digit numbers to derive associative facts, (e.g. 600 ÷ 3 = 200 can be derived from 2 x 3 = 6). To recognise and use factor pairs and commutativity in mental calculations. To use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and	To multiply and divide numbers mentally drawing upon known facts.	To perform mental calculations, including with mixed operations and large numbers.

					1; dividing by 1; multiplying together three numbers.		
					MULTIPLICATION AND DIVISION FACTS		
			To make connections between arrays, number patterns, and counting in twos, fives and tens. Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.	To use a variety of language to describe multiplication and division. To count from 0 in multiples of 4, 8, 50 and 100. To recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers and use them to solve simple problems, demonstrating an understanding of commutativity as necessary. To connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.	To recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables when they are calculating mathematical statements in order to improve fluency. To connect the 2, 4 and 8 multiplication tables through doubling.	To recall multiplication and division facts for multiplication tables up to 12 × 12 to aid fluency. To 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)).	To apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.	To continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.
					WRITTEN CALCULATIONS		
			To calculate mathematical statements for multiplication and division within the multiplication tables and write them using	To write and calculate mathematical statements for multiplication and division using the multiplication tables	To multiply two-digit and three-digit numbers by a one-digit number using the formal written layout *of short*	To multiply numbers up to four digits by a one- or two-digit number using a formal written method, including long multiplication	To multiply multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication.

			the multiplication (×), division (÷) and equals (=) signs.

To begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations | that they know, including for two-digit numbers times one-digit numbers, using *efficient* mental *methods, for example, using commutativity and associativity,* and progressing to formal *reliable* written methods *of short multiplication and division*. *(included in mental calculation section)* | *multiplication with exact answers.*

To become fluent in the formal written method of short division with exact answers. | for two-digit numbers fluently.

To divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context fluently.

To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. | To divide numbers up to four 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.

To divide numbers up to four digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. Perform mental calculations, including with mixed operations and large numbers. |

| **PROPERTIES OF NUMBERS** |||||||

| | | | | | | To use and understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements. | To identify common factors, common multiples and prime numbers. |

						To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. To establish whether a number up to 100 is prime and recall prime numbers up to 19. To recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).	
ORDER OF OPERATIONS							
							To use their knowledge of the order of operations to carry out calculations involving the four operations.
SOLVE PROBLEMS							
		To solve one-step problems involving multiplication and division, by calculating the answer using	To solve problems involving multiplication and division, using materials, arrays, repeated addition,	To solve *simple* problems *in contexts, deciding which of the four operations to use and why.* These	To solve *two-step* problems *in contexts* involving multiplying and adding, including using the distributive law to	To solve problems involving multiplication and division including using their knowledge of factors	To solve problems involving addition, subtraction, multiplication and division.

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
		concrete objects, pictorial representations and arrays with the support of the teacher.	mental methods, and multiplication and division facts, including problems in contexts.	include missing number problems, involving multiplication and division, including *measuring* and positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems, such as n objects are connected to m objects.	and multiples, squares and cubes. To solve problems, *including in missing number problems,* involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign *(to indicate equivalence).* To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	To use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
FRACTIONS, DECIMALS AND PERCENTAGES	**COUNTING**						
			To count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.	To count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by ten.	To count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	To extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line. To continue to practise counting forwards and backwards in simple fractions.	To count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.

		RECOGNISING, FINDING AND NAMING				
	To recognise, find and name a half as one of two equal parts of an object, shape or quantity *by solving problems*. To recognise, find and name a quarter as one of four equal parts of an object, shape or quantity *by solving problems* *To 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*	To recognise, find, name, identify and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{2}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of a length, number, shape, set of objects or quantity and know that all parts must be equal parts of the whole. *To 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. They meet $\frac{3}{4}$ as the first example of a non-unit fraction.*	*To understand the relation between unit fractions as operators (fractions of), and division by integers.* To recognise, *understand* and use fractions as numbers: unit fractions and non-unit fractions with small denominators *as numbers on the number line (going beyond 0 -1 and relating this to measure), and deduce relations between them, such as size and equivalence*. To recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.	*To make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities.* *To know that decimals and fractions are different ways of expressing numbers and proportions.* *To understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths.*	To identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.	To recognise, find, name, identify and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{2}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of a length, number, shape, set of objects or quantity and know that all parts must be equal parts of the whole. *To 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. They meet $\frac{3}{4}$ as the first example of a non-unit fraction.*
		COMPARING AND ORDERING				
			To compare and order unit fractions, and fractions with the same denominators.		To compare and order fractions whose denominators are all multiples of the same number.	To compare and order fractions, including fractions > 1.
		ADDING AND SUBTRACTING				
			To add and subtract fractions with the same denominator	To add and subtract fractions with the same denominator	To add and subtract fractions with the same denominator	To add and subtract fractions with different

				within one whole *through a variety of increasingly complex problems to improve fluency.*	*to become fluent through a variety of increasingly complex problems beyond one whole.*	and denominators that are multiples of the same number *to become fluent through a variety of increasingly complex problems.* To recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number.	denominators and mixed numbers, using the concept of equivalent fractions *starting with fractions where the denominator of one fraction is a multiple of the other and progress to varied and increasingly complex problems.*
MULTIPLYING AND DIVIDING							
						To continue to develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities. To multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	To multiply simple pairs of proper fractions, writing the answer in its simplest form using a variety of images to support their understanding of multiplication with fractions. To divide proper fractions by whole numbers.
EQUIVALENCE							
			To write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence $\frac{2}{4}$ and $\frac{1}{2}$.	To recognise and show, using diagrams, equivalent fractions with small denominators.	To use factors and multiples to recognise equivalent fractions and simplify where appropriate.	To read and write decimal numbers as fractions. To recognise and use thousandths and relate them to	To recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

					To recognise and show, using diagrams, families of common equivalent fractions. To recognise and write decimal equivalents of any number of tenths or hundredths. To recognise and write decimal equivalents to $\frac{11}{44}$, $\frac{11}{22}$, $\frac{3}{4}$ $\frac{3}{4}$.	tenths, hundredths, decimal equivalents *and measures*. To 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.	To use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
COMAPRING AND ORDERING DECIMALS
					To learn decimal notation and the language associated with it, including in the context of measurements. To represent numbers with one or two decimal places in several ways, such as on number lines. To compare numbers, amounts and quantities with the same number of decimal places up to two decimal places.	To read, *say,* write, order and compare numbers with up to three decimal places.	To identify the value of each digit in numbers given to three decimal places.
ROUNDING DECIMALS
					To round decimals with one decimal place to the nearest whole number.	To round decimals with two decimal places to the nearest whole number and	

					to one decimal place.	
	...					

					to one decimal place.	
ADDING AND SUBTRACTING DECIMALS						
					To mentally add and subtract tenths, and one-digit whole numbers and tenths. To practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1.	
MULTIPLYING AND DIVIDING DECIMALS						
				To 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.		To multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places. To associate a fraction with division and calculate decimal fraction equivalents for a simple fraction. To multiply one-digit numbers with up to two decimal places by whole numbers *in practical contexts, such as measures and money*.

							To multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers in practical contexts involving measures and money.
							To use written division methods in cases where the answer has up to two decimal places.
							To recognise division calculations as the inverse of multiplication.
SOLVE PROBLEMS							
				To solve problems that involve all of the above.	To 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. To solve simple measure and money problems involving fractions and decimals to two decimal places.	To solve problems involving numbers up to three decimal places. To *make connections between percentages, fractions and decimals and relate this to finding 'fractions of' to solve problems which require knowing percentage and decimal equivalents of* $\frac{11}{22}$, $\frac{11}{44}$, $\frac{11}{55}$, $\frac{22}{55}$, $\frac{44}{55}$ *and those fractions with a denominator of a multiple of 10 or 25.*	To solve problems which require answers to be rounded to specified degrees of accuracy *and checking the reasonableness of their answers*.

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
ALGEBRA							
							To introduce the language of algebra as a means for solving a variety of problems.

To introduce the use of symbols and letters to represent variables and unknowns in mathematical familiar situations, such as: missing numbers, lengths, coordinates and angles.

To use simple formulae.

To generate and describe linear number sequences. To express missing number problems algebraically.

To find pairs of numbers that satisfy an equation with two unknowns.

To enumerate possibilities of combinations of two **variables.** |

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
MEASUREMENT	**DESCRIBE, MEASURE, COMPARE AND SOLVE**						
	Compare length, weight and capacity.	To compare, describe and solve practical problems for: lengths and heights, mass/weight, capacity and volume, time. To measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time. *To 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 using measuring tools, such as a ruler, weighing scales and containers.*	To choose and use appropriate standard units *with increasing accuracy using their knowledge of the number system* 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, thermometers and measuring vessels. *To use the appropriate language and record using standard abbreviations.* To compare and order lengths, mass, volume/capacity and record the results using >, < and =. *To compare measures including simple multiples such as 'half as high'; 'twice as wide'.*	To measure *using the appropriate tools and units*, compare (*including simple scaling by integers*) add and subtract *using mixed units*: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).	To estimate, compare and calculate different measures, including money in pounds and pence.	To use all four operations to solve problems involving measure using decimal notation, including scaling *and conversions*.	*To use a number line, to add and subtract positive and negative integers for measures such as temperature.* To solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.

					CONVERTING UNITS		
					To use multiplication to convert from larger to smaller units. To convert between different units of measure and build on their understanding of place value and decimal notation to record metric measures, including money.	To use the knowledge of place value and multiplication and division to convert between standard units. To convert between different units of metric measure. To understand and use approximate equivalences between metric units and common imperial units.	To use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. To convert between miles and kilometres. To know approximate conversions to tell if an answer is sensible.
					TELLING THE TIME		
		To sequence events in chronological order using language. To recognise and use language relating to dates, including days of the week, weeks, months and years. To tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	To read, tell and write the time to five minutes, including quarter past/to the hour/half hour and draw the hands on a clock face to show these times. To become fluent in telling the time on analogue clocks and recording it. To know the number of minutes in an hour and the number of hours in a day.	To tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. To begin to use digital 12-hour clocks and record their times in preparation for using digital 24-hour clocks in year 4. To estimate and read time with increasing accuracy to the nearest minute; record and	To read, write and convert time between analogue and digital 12- and 24-hour clocks. To solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	To solve problems involving converting between units of time.	

| | | To compare and sequence intervals of time. | compare time in terms of seconds, minutes and hours.

To use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.

To know the number of seconds in a minute and the number of days in each month, year and leap year.

To compare durations of events. | | | |
|---|---|---|---|---|---|---|

PERIMETER, AREA AND VOLUME						
To measure the perimeter of simple 2D shapes.	To measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.

To know perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit.

To find the area of rectilinear shapes by counting squares.
To relate area to arrays and multiplication. | To measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres including using the relations of perimeter. Note: Missing measures questions can be expressed algebraically.

To calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²), use the area of rectangles to find unknown lengths and estimate the area | To recognise that shapes with the same areas can have different perimeters and vice versa.

To recognise when it is possible to use formulae for area and volume of shapes.

To relate the area of rectangles to parallelograms and triangles and calculate their areas, understanding and using the formulae (in words or symbols) to do this.

To calculate the area of parallelograms and triangles. | To measure the perimeter of simple 2D shapes. | To measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.

To know perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit.

To find the area of rectilinear shapes by counting squares.
To relate area to arrays and multiplication. | To measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres including using the relations of perimeter. Note: Missing measures questions can be expressed algebraically.

To calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²), use the area of rectangles to find unknown lengths and estimate the area |

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
			of irregular shapes. Note: Missing measures questions can be expressed algebraically. To calculate the area from scale drawings using given measurements. To estimate volume.	To calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units (for example, mm³ and km³).			of irregular shapes. Note: Missing measures questions can be expressed algebraically. To calculate the area from scale drawings using given measurements. To estimate volume.
PROPERTIES OF SHAPES	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	RECOGNISE 2D AND 3D SHAPES AND THEIR PROPERTIES						
	Select, rotate and manipulate shapes in order to develop spatial reasoning skills	To recognise, handle and name common 2D and 3D shapes in different orientations/sizes and relate everyday objects fluently. To recognise that rectangles, triangles, cuboids and pyramids are not always similar to each other.	Pupils read and write names for shapes that are appropriate for their word reading and spelling. To handle, identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line. To handle, identify and describe the properties of 3D shapes, including the number of edges, vertices and faces. To identify 2D shapes on the surface of 3D shapes.	To describe the properties of 2D and 3D shapes using accurate language. To extend knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygon and polyhedron. To recognise 3D shapes in different orientations and describe them.	To identify lines of symmetry in 2D shapes presented in different orientations. To recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape.	To identify 3D shapes, including cubes and other cuboids, from 2D representations.	To illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. To express algebraically the relationship between angles and lengths.
	COMPARE AND CLASSIFY SHAPES						
	Compose and decompose shapes		To identify, compare and sort common 2D		To compare lengths and angles to decide	To distinguish between regular and	To compare and classify geometric

			and 3D shapes and everyday objects on the basis of their properties and use vocabulary precisely.		if a polygon is regular or irregular. To compare and classify geometric shapes, including different quadrilaterals and triangles, based on their properties and sizes.	irregular polygons based on reasoning about equal sides and angles.	shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons using known measurements.
DRAWING 2D SHAPES AND CONSTRUCTING 3D SHAPES							
	Select, rotate and manipulate shapes in order to develop spatial reasoning skills. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.		*Pupils draw lines and shapes using a straight edge.*	To connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts. To identify horizontal and vertical lines and pairs of perpendicular and parallel lines. To draw 2D shapes and make 3D shapes using modelling materials.	To draw with increasing accuracy and develop mathematical reasoning to analyse shapes and their properties and confidently describe the relationships between them. To complete a simple symmetric figure with respect to a specific line of symmetry.	To become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor. To use conventional markings for parallel lines and right angles	To draw 2D shapes and nets accurately using given dimensions and angles using measuring tools, conventional markings and labels for lines and angles. To recognise, describe and build simple 3D shapes, including making nets.
ANGLES							
				To recognise angles as a property of shape or a description of a turn. To identify right angles, recognise	To identify acute and obtuse angles and compare and order angles up to two right angles by size	To know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles.	To recognise angles where they meet at a point, are on a straight line, or are vertically opposite,

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
				that two right angles make a half-turn, three make three quarters of a turn and four a complete turn To identify whether angles are greater than or less than a right angle.	in preparation for using a protractor.	To draw given angles, and measure them in degrees. To identify: angles at a point and one whole turn (total 360˚), angles at a point on a straight line and $\frac{1}{2}$ $\frac{1}{2}$ a turn (total 180˚) and other multiples of 90˚. *To use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides.* To use the properties of rectangles to deduce related facts and find missing lengths and angles *by using angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems*.	and find missing angles.
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
POSITION AND DIRECTION	**POSITION, DIRECTION AND MOVEMENT**						
	Draw information from a simple map.	To describe position, direction and movement, including whole, half, quarter and three-quarter turns in both	To use mathematical vocabulary to describe position, direction and movement, including movement in a		To describe positions on a 2D grid as coordinates in the first quadrant.	To identify, describe and represent the position of a shape following a reflection (in lines that are parallel to the axes)	To draw and label a pair of axes in all four quadrants with equal scaling.

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
		directions and connect clockwise with the movement on a clock face. To 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.	straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).		To draw a pair of axes in one quadrant, with equal scales and integer labels. To read, write and use pairs of coordinates, including using coordinate plotting ICT tools. To plot specified points and draw sides to complete a given polygon. To describe movements between positions as translations of a given unit to the left/right and up/down.	or translation, using the appropriate language, and know that the shape has not changed.	To describe positions on the full coordinate grid (all four quadrants). To draw and label simple shapes – rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. To translate simple shapes where coordinates may be expressed algebraically on the coordinate plane and reflect them in the axes.
			PATTERNS				
			To order and arrange combinations of mathematical objects and *shapes, including those in different orientations,* in patterns and sequences.				
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
STATISICS			**RECORD, REPRESENT AND INTERPRET DATA**				
			To record, interpret, collate, organise and compare information.	To interpret and present data using bar charts, pictograms and	To understand and use a greater range of scales in data representations.	To begin to decide which representations of data are most	To connect conversion from kilometres to miles in measurement to

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
			To interpret and construct simple pictograms, tally charts, block diagrams and simple tables (e.g. many-to-one correspondence in pictograms with simple ratios 2, 5, 10 scales). To ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. To ask and answer questions about totalling and comparing categorical data.	tables and use simple scales with increasing accuracy.	To interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	appropriate and why. To connect coordinates and scales to the interpretation of time graphs. To complete, read and interpret information in tables, including timetables.	its graphical representation. To connect work on angles, fractions and percentages to the interpretation of pie charts. To interpret and construct pie charts and line graphs (relating to two variables) and use these to solve problems.
SOLVE PROBLEMS							
				To solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables.	To solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	To solve comparison, sum and difference problems using information presented in a line graph.	*To know when it is appropriate to find the mean of a data set.* To calculate and interpret the mean as an average.
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
RATIO AND PROPORTION							To recognise proportionality in contexts when the relations between quantities are in the same ratio, e.g. recipes.

| | | | | | | To solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.

To solve problems involving the calculation of percentages and the use of percentages for comparison including linking percentages or 360° to calculating angles of pie chart.

To solve problems involving similar shapes where the scale factor is known or can be found.

To solve problems involving unequal quantities, sharing and grouping using knowledge of fractions and multiples. |
|---|---|---|---|---|---|---|---|

MATHS PROGRESSION OF VOCABULARY

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
NUMBER AND PLACE VALUE	Number One, two, three to twenty and beyond.	Number Zero, one, two, three to twenty, and beyond	Numbers to one hundred	Numbers to one thousand	Tenths, hundredths Decimal (places)	Powers of 10	Numbers to ten million
			Hundreds		Round (to nearest)		
	None	None	Partition, recombine		Thousand more/less than		
			Hundred more/less		Negative integers		
	Count on/up/to/from/down	Count (on/up/to/from/ down)			Count through zero		
					Roman numerals (I to C)		
	Before, after						
		Before, after					
	More, less, many, few, fewer, fewest, smaller, smallest	More, less, many, few, fewer, least, fewest, smallest, greater, lesser					
	Equal to, the same as						
		Equal to, the same as					
	Odd, even						
		Odd, even,					
	Digit						
	Numeral	Pair					

	Compare	Units, ones, tens					
	Order	Ten more/less					
	Size	Digit					
	Value	Numeral Figure(s)					
	Between, halfway between	Compare (In) order/a different order					
		Size					
		Value					
		Between, halfway between					
		Above, below					
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
ADDITION AND SUBTRACTION	Number line	Number bonds, number line		Column addition and subtraction		Efficient written method	Order of operations

	Add, more, plus, make, sum, total, altogether Double Half, halve Equals, is the same (including equals sign) How many more to make…? How many more is,,, then,,,? How much more is…? Subtract, take away, minus.	Add, more, plus, make, sum, total, altogether Inverse Double, near double Half, halve Equals, is the same as (including equals sign) Difference between How many more to make..?, how many more is…than..?, how much more is..? Subtract, take away, minus How many fewer is…than..?, how much less is..?					
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
MULTIPLICATION AND DIVISION	Odd, even	Odd, even		Product	Multiplication facts (up to 12x12)	Factor pairs	Order of operations

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	Double, halve Share, share equally Group in pairs Equal groups of Divide	Count in twos, threes, fives Count in tens (forwards from/backwards from) How many times? Lots of, groups of Once, twice, three times, five times Multiple of, times, multiply, multiply by Repeated addition Array, row, column Double, halve Share, share equally Group in pairs, threes, etc. Equal groups of Divide, divided by, left, left over		Multiples of four, eight, fifty and one hundred Scale up	Division facts Inverse Derive	Composite numbers, prime number, prime factors, square number, cubed number Formal written method	Common factors, common multiples
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
FRCTIONS, DECIMALS AND PERCENTAGES	Whole Equal	Equal parts, four equal parts One half, two halves	Three quarters, one third, a third	Numerator, denominator	Equivalent decimals and fractions	Proper fractions, improper fractions, mixed numbers	Degree of accuracy Simplify

	One half	A quarter, two quarter	Equivalence, equivalent	Unit fraction, non- unit fraction Compare and order Tenths		Percentage Half, quarter, fifth, two fifths, four fifths Ratio, proportion	
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
ALGEBRA							Linear number sequence Substitute Variables Symbol Known values
	RECEPTION	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
MEASURE	Full, half, empty Holds	Full, half full, empty Holds Container	Quarter past/to m/km, g/kg, ml/l Temperature (degrees)	Leap year Twelve- hour/twenty- four- hour clock	Convert	Volume Imperial units, metric units	

	Container Weigh, weighs, balance Heavy, heavier, heaviest, light, lighter, lightest Scales Time Days of the week: Monday, Tuesday etc. Seasons: Spring, Summer, Autumn, Winter Days, week, month, year, weekend Birthday, holiday	Weigh, weighs, balances Heavy, heavier, heaviest, light, lighter, lightest Scales Time Days of the week: Monday, Tuesday, etc. Seasons: spring, summer, autumn, winter Day, week, month, year, weekend Birthday, holiday Morning, afternoon, evening, night, midnight Bedtime, dinnertime, playtime Today, yesterday, tomorrow Before, after		Roman numerals I to XIII		

	Morning, afternoon, evening, night	Next, last			
	Bedtime, dinnertime, playtime	Now, soon, early, late			
	Today, yesterday, tomorrow	Quick, quicker, quickest, quickly , fast, faster, fastest, slow, slower, slowest, slowly			
	Before, after, next, last	Old, older, oldest, new, newer, newest			
	Quickest, fastest, slowest	Takes longer, takes less time			
	Clock	Hour, o'clock, half past			
		Clock, watch, hands			
	Once	How long ago?, how long will it be to...?, how long will it take to...?, how often?			
	First, second, third	Always, never, often, sometimes, usually			
		Once, twice			
	Estimate	First, second, third, etc.			
	Too many, too few				

	Length, height Longer, longest, shorter, shortest, taller, tallest, higher, highest Money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change How much? How many? Total	Estimate, close to, about the same as, just over, just under Too many, too few, not enough, enough Length, width, height, depth Long, longer, longest, short, shorter shortest, tall, taller, tallest, high, higher, highest Low, wide, narrow, deep, shallow, thick, thin Far, near, close Metre, ruler, metre stick Money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change, dear(er), costs more, costs less, cheaper, costs the same as How much?, how many? Total					

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
POSITION AND DIRECTION	Over, under, underneath, above, below, top, bottom, side On, in, outside, inside In front, behind Front, back Before, after Beside, next to Middle Up, down, forwards, backwards. Sideways	Position Over, under, underneath, above, below, top, bottom, side on, in, outside, inside around, in front, behind Front, back Before, after Beside, next to, Opposite Apart Between, middle, edge, centre Corner Direction Journey Left, right, up, down, forwards, backwards, sideways	Rotation Clockwise, anticlockwise Straight line Ninety degree turn, right angle	Greater/less than ninety degrees Orientation (same orientation, different orientation)	Coordinates Translation Quadrant x-axis, y-axis Perimeter and area	Reflex angle Dimensions	Four quadrants (for coordinates)

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	Close, far

Through

Towards, away from

Side, roll, turn | Across

Close, far, near

Along, through

To, from, towards, away from

Movement

Slide, roll, turn, whole turn, half turn

Stretch, bend | | | | | |
| **PROPERTIES OF SHAPE** | Sort

Cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square

Shape

Flat, curved, straight, round

Solid | Group, sort

Cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square

Shape

Flat, curved, straight, round

Hollow, solid

Corner (point, pointed)

Face, side, edge

Make, build, draw | Size

Bigger, larger, smaller

Symmetrical, line of symmetry

Fold

Match

Mirror line, reflection | Horizontal, vertical, perpendicular and parallel lines | Quadrilaterals

Triangles

Right angle, acute and obtuse angles | Regular and irregular Polygons | Vertically opposite (angles)

Circumference, radius, diameter |

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	Corner Face, side Make, build, draw		Pattern, repeating pattern				
DATA AND STATISTICS			Count, tally, sort Vote Graph, block graph, pictogram, Represent Group, set, list, table Label, title Most popular, most common,	Chart, bar chart, frequency table, Carroll diagram, Venn diagram Axis, axes Diagram	Continuous data Line graph		Mean Pie chart Construct

	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
			least popular, least common				
PROBLEM SOLVING	Listen, join in Say, think, imagine, remember Start from Look at, point to Put What comes next? Find, use, make, build Tell me, describe, pick out, talk about, explain, show me	Listen, join in Say, think, imagine, remember Start from, start with, start at Look at, point to Put, place, fit Arrange, rearrange Change, change over Split, separate Carry on, continue, repeat, what comes next? Find, choose, collect, use, make, build Tell me, describe, pick out, talk about, explain, show me Read, write, record, trace, copy, complete, finish, end	Predict Describe the pattern, describe the rule Find, find all, find different Investigate				

	Read, write	Fill in, shade, colour, tick, cross, draw, draw a line between, join (up), ring, arrow				
	Tick, draw a line, ring					
	Cost	Cost				
	Count, work out	Count, work out, answer, check same number(s)/different number(s)/missing number(s)				
	Number line, number track, number square, number cards	Number facts, number line, number track, number square, number cards				
	Counters, cubes, blocks, die, dice, dominoes, pegs, peg board	Abacus, counters, cubes, blocks, rods, die, dice, dominoes, pegs, peg board				
	Same way, different way	Same way, different way, best way, another way				
	In order, in a different order	In order, in a different order				
		Not all, every, each				