MATHEMATICS

Heavers Farm and Selsdon Primary Schools

PROGRESSION DOCUMENT

This document outlines progression in maths from Nursery to Year Six.

- *Mathematical Vocabulary highlights the vocabulary introduced throughout the primary curriculum – from Nursery to Year 6.*
- *The vocabulary listed here is vocabulary that pupils are expected to use and understand on a daily basis within that year group. The vocabulary listed is cumulative and builds on the vocabulary previously introduced. Teachers should also consult with the Mathematics Mastery Primary Glossary and the*
- *Mathematics Mastery vocabulary list (which includes definitions and examples).*
- *This is a working document and will be updated as required.*

MATHEMATICAL VOCABULARY							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Use a wider range of vocabulary. Understand 'why' questions, like: "why do you think the caterpillar is so fat?"	Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. Use new vocabulary throughout the day. Above, Add, Addition, Altogether, Balance, Before, Below, Between, Capacity, Circle, Clock, Compare, Corner, Cost, Count, Cube, Cuboid, Curved, surface, Cylinder, 2-D, 3-D, Describe, Difference, Direction, Distance, Double, Edge, Empty, Equal, Face, Fewer, First, Flat, Full, Group, Half,	Analogue clock, Anticlockwise, Approximate, Array, Block graph, Chart, Chronological, Clockwise, Cone, Continuous surface, Data, Decreasing, Diagram, Digit, Divide, Estimate, Even number, Facts, Fraction, Half turn, Hour, Increasing, Kilogram, Known fact, Left, Litre, Mental calculation, Metre, Minute, Oblong, Odd number, Partition, Place value, Position, Pound (sterling), Property, Pyramid, Quantity, Quarter, Quarter turn, Repeated addition, Repeated subtraction,	Angle, Calculate, Centimetre, Column, Commutative, Consecutive, Denominator, Division, Efficient, Frequency, Gram, Heptagon, Hexagon, Inverse, operations, Millilitre, Multiple, Multiplication, Multiply, Near double, Non-unit fraction, Numerator, Octagon, Operation, Pentagon, Pictogram, Quadrilateral, Relationship, Right angle, Rotation, Scale, Symmetry, Tally, Temperature, Unit fraction, Vinculum,	Acute angle, Axis (plural: axes), Bar graph, Columnar addition/subtraction, Factor, Formal written methods, Horizontal, Irregular, Kilometre, Millimetre, Numeral, Obtuse angle, Parallel, Perimeter, Perpendicular, Place holder, Prism, Product, Regular, Roman numeral, Round, Square-based pyramid, Triangle-based pyramid,	Area, Associative law, Convert, Coordinate, Decimal, fraction, Distributive law, Dividend, Divisor, Equilateral, Equivalent, Expression, Grid, Improper fraction, Integer, Interval, Isosceles, Kite, Line graph, Mixed numbers, Negative number, Parallelogram, Plot, Point, Positive number, Proper fraction, Protractor, Quotient, Rectilinear, Rhombus, Scalene, Short division, Short multiplication, Simplify, Square	Angle at a point, Angle on a line, Average (mean), Common factor, Common multiple, Congruent, Cube number, Cubic centimetre, Cubic metre, Decagon, Degree, Diagonal, Divisible, Dodecagon, Long division, Long multiplication, Negative integer, Nonagon, Percentage, Polygon, Polyhedron (pl. polyhedra), Prime factor, Prime number, Remainder, Reflection, Reflex angle, Scale (not to scale), Square metre, Square number, Tetrahedron,	Arc, Brackets, Centre, Circumference, Compasses, Common fraction, Degree of accuracy, Diameter, Equivalent expression, Factorise, Foot/feet, Formula, Gallon, Imperial unit, Inch, Intersect, Metric unit, Mile, Net, Order of operations, Origin, Ounce, Pie chart, Pint, Pound (mass), Proportion, Quadrant, Radius, Ratio, Similar, Square millimetre, Square kilometre, Vertically opposite angles

	Intersection of sets, Last, Length, Less Line, Long, Mass, Measure, Minus, More, Next, Number bond, Number line, Number track, Order, Pair Pattern, Plus, Rectangle, Second, Sequence, Set, Share, Short, Side, Size, Sort, Square, Straight, Subtract, Subtraction, Sum, Surface, Take away, Tall, Time, Total, Triangle, Venn diagram, Vertex (pl. vertices), Weight, Zero,	Represent, Right, Rule Scales, Sign, Standard unit, Sphere, Symbol, Table, Turn, Unit, Volume,			centimetre, Trapezium,	Transformation, Translation,	

Number: Number and Place Value

COUNTING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Recite numbers past 5. Say one number name for each item in order: 1, 2, 3, 4, 5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').	Count objects, actions and sounds. Count beyond ten Verbally count beyond 20, recognising the pattern of the counting system.	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens given a number, identify one more and one less	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	count backwards through zero to include negative numbers count in multiples of 6, 7, 9, 25 and 1 000 find 1000 more or less than a given number	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero count forwards or backwards in steps of powers of 10 for any given number up to 1000 000	use negative numbers in context, and calculate intervals across zero

COMPARING NUMBERS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use <, > and = signs	compare and order numbers up to 1 000	order and compare numbers beyond 1 000 *compare numbers with the same number of decimal places up to two decimal places* (copied from Fractions)	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)

IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals.	Subitise (to look at a group of objects and realise how many there are without counting). Link the number symbol (numeral) with its cardinal number value.	identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line; to at least 100 using counting, reading, writing and comparing numbers, solving a variety of related problems to develop fluency.	identify, represent and estimate numbers using different representations; pupils continue to count in ones, tens and hundreds, so that they become fluent in the order and place value of numbers to 1000. including those related to measure.	identify, represent and estimate numbers using different representations; pupils become fluent in the order and place value of numbers beyond 1000, including counting in tens and hundreds, and maintaining fluency in other multiples through varied and frequent practice.		

READING AND WRITING NUMBERS *(including Roman Numerals)*							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals Experiment with their own symbols and marks as well as numerals. Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'more than', 'fewer than'	Link the number symbol (numeral) with its cardinal number value.	Read and write numbers from 1 to 20 in numerals and words.	Read and write numbers to at least 100 in numerals and in words	Read and write numbers up to 1 000 in numerals and in words *Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks* (copied from Measurement)	Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers) Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)

<table>
<tr><th colspan="8">UNDERSTANDING PLACE VALUE</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td rowspan="2"></td><td rowspan="2">Understand the ‘one more than/one less than’ relationship between consecutive numbers
Explore the composition of numbers to 10.</td><td rowspan="2"></td><td rowspan="2">recognise the place value of each digit in a two-digit number (tens, ones)</td><td rowspan="2">recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</td><td>recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</td><td rowspan="2">read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)

recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)</td><td>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)</td></tr>
<tr><td>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 units, tenths and hundredths (copied from Fractions)</td><td>identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places (copied from Fractions)</td></tr>
</table>

ROUNDING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					round any number to the nearest 10, 100 or 1 000	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	round any whole number to a required degree of accuracy
					round decimals with one decimal place to the nearest whole number (copied from Fractions)	*round decimals with two decimal places to the nearest whole number and to one decimal place* (copied from Fractions)	*solve problems which require answers to be rounded to specified degrees of accuracy* (copied from Fractions)

PROBLEM SOLVING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		3-4: Solve real world mathematical problems with numbers up to 5	use place value and number facts to solve problems	solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above

Number: Addition and Subtraction

NUMBER BONDS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				

MENTAL CALCULATION							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Automatically recall number bonds for numbers 0-5 and some to 10.	add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
		read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				use their knowledge of the order of operations to carry out calculations involving the four operations

PROBLEM SOLVING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.		solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods *	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
			solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)				Solve problems involving addition, subtraction, multiplication and division

Number: Multiplication and Division

MULTIPLICATION & DIVISION FACTS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		count in multiples of twos, fives and tens (copied from Number and Place Value)	*count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value)	*count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value)	*count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value)	*count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000* (copied from Number and Place Value)	
			recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	recall multiplication and division facts for multiplication tables up to 12 × 12		

MENTAL CALCULATION							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		count in multiples of twos, fives and tens (copied from Number and Place Value) show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) numbers	multiply and divide numbers mentally drawing upon known facts multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	perform mental calculations, including with mixed operations and large numbers *associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)* (copied from Fractions)	

WRITTEN CALCULATION							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
						divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number

							remainders, fractions, or by rounding, as appropriate for the context
							use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))

PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					recognise and use factor pairs and commutativity in mental calculations (repeated)	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	identify common factors, common multiples and prime numbers *use common factors to simplify fractions; use common multiples to express fractions in the same denomination* (copied from Fractions)
						know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	
						establish whether a number up to 100 is prime and recall prime numbers up to 19	
						recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	*calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3* (copied from Measures)

WRITTEN METHODS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)		read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)	

INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

ORDER OF OPERATIONS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
							use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS							
				estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)	*estimate and use inverse operations to check answers to a calculation* (copied from Addition and Subtraction)		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

<table>
<tr><th colspan="8">PROBLEM SOLVING</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher</td><td rowspan="3">solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</td><td rowspan="3">solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects</td><td rowspan="3">solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects</td><td>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</td><td rowspan="2">solve problems involving addition, subtraction, multiplication and division</td></tr>
<tr><td>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</td></tr>
<tr><td>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</td><td>solve problems involving similar shapes where the scale factor is known or can be found
(copied from Ratio and Proportion)</td></tr>
</table>

Number: Fractions (including Decimals and Percentages)

COUNTING IN FRACTIONAL STEPS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)	count up and down in tenths	count up and down in hundredths		

<table>
<tr><th colspan="8">RECOGNISING FRACTIONS</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2">recognise, find and name a half as one of two equal parts of an object, shape or quantity</td><td rowspan="3">recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity</td><td>recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</td><td rowspan="3">recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten</td><td rowspan="3">recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)</td><td rowspan="3"></td></tr>
<tr><td>recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.</td></tr>
<tr><td></td><td></td><td>recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</td><td>recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</td></tr>
<tr><th colspan="8">COMPARING FRACTIONS</th></tr>
<tr><td></td><td></td><td></td><td></td><td>compare and order unit fractions, and fractions with the same denominators</td><td></td><td>compare and order fractions whose denominators are all multiples of the same number</td><td>compare and order fractions, including fractions >1</td></tr>
</table>

COMPARING DECIMALS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					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	identify the value of each digit in numbers given to three decimal places

ROUNDING INCLUDING DECIMALS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy

<table>
<tr><th colspan="8">EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">write simple fractions e.g. 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2.</td><td rowspan="3">recognise and show, using diagrams, equivalent fractions with small denominators</td><td>recognise and show, using diagrams, families of common equivalent fractions</td><td>identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</td><td>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</td></tr>
<tr><td rowspan="2">recognise and write decimal equivalents of any number of tenths or hundredths</td><td>read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$)</td><td rowspan="2">associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$)</td></tr>
<tr><td>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$</td><td>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 as a decimal fraction</td><td>recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</td></tr>
</table>

ADDITION AND SUBTRACTION OF FRACTIONS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				add and subtract fractions with the same denominator within one whole (e.g. $^{5}/_{7} + {}^{1}/_{7} = {}^{6}/_{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5} = 1{}^{1}/_{5}$)	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

MULTIPLICATION AND DIVISION OF FRACTIONS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
						multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^{1}/_{4} \times {}^{1}/_{2} = {}^{1}/_{8}$) multiply one-digit numbers with up to two decimal places by whole numbers divide proper fractions by whole numbers (e.g. $^{1}/_{3} \div 2 = {}^{1}/_{6}$)

MULTIPLICATION AND DIVISION OF DECIMALS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					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		multiply one-digit numbers with up to two decimal places by whole numbers
							multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
							identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
							associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$)
							use written division methods in cases where the answer has up to two decimal places

PROBLEM SOLVING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				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	solve problems involving numbers up to three decimal places	
					solve simple measure and money problems involving fractions and decimals to two decimal places.	solve problems which require knowing percentage and decimal equivalents of $^{1}/_{2}$, $^{1}/_{4}$, $^{1}/_{5}$, $^{2}/_{5}$, $^{4}/_{5}$ and those with a denominator of a multiple of 10 or 25.	

Ratio and Proportion

Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
							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.

Algebra

<table>
<tr><th colspan="8">EQUATIONS</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as
7 = □ - 9
(copied from Addition and Subtraction)</td><td>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.
(copied from Addition and Subtraction)</td><td>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
(copied from Addition and Subtraction)</td><td rowspan="3"></td><td rowspan="3">use the properties of rectangles to deduce related facts and find missing lengths and angles
(copied from Geometry: Properties of Shapes)</td><td>express missing number problems algebraically</td></tr>
<tr><td rowspan="2">recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
(copied from Addition and Subtraction)</td><td rowspan="2">solve problems, including missing number problems, involving multiplication and division, including integer scaling
(copied from Multiplication and Division)</td><td>find pairs of numbers that satisfy number sentences involving two unknowns</td></tr>
<tr><td></td><td></td><td>represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)</td><td>enumerate all possibilities of combinations of two variables</td></tr>
</table>

FORMULAE							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. *(Copied from NSG measurement)*		use simple formulae *recognise when it is possible to use **formulae** for area and volume of shapes* (copied from Measurement)
SEQUENCES							
		sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (copied from Measurement)	*compare and sequence intervals of time* (copied from Measurement) *order and arrange combinations of mathematical objects in patterns* (copied from Geometry: position and direction)				generate and describe linear number sequences

Measurement

<table>
<tr><th colspan="8">COMPARING AND ESTIMATING</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td>Make comparisons between objects relating to size, length, weight and capacity.</td><td>Compare length, weight and capacity.</td><td rowspan="2">compare, describe and solve practical problems for:
* lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half]
* mass/weight [e.g. heavy/light, heavier than, lighter than]
* capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]
* time [e.g. quicker,</td><td rowspan="2">compare and order lengths, mass, volume/capacity and record the results using >, < and =</td><td rowspan="2"></td><td rowspan="2">estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)</td><td>calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes (also included in measuring)</td><td rowspan="2">calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3.</td></tr>
<tr><td></td><td></td><td>estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and</td></tr>
</table>

		slower, earlier, later]				capacity (e.g. using water)	
		sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	compare and sequence intervals of time	compare durations of events, for example to calculate the time taken by particular events or tasks			
				estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)			

MEASURING and CALCULATING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		measure and begin to record the following: * **lengths and heights** * **mass/weight** * **capacity and volume** * **time** (hours, minutes, seconds**)**	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, thermometers and measuring vessels	measure, compare, add and subtract: **lengths** (m/cm/mm); **mass** (kg/g); **volume/capacity** (l/ml)	estimate, compare and calculate **different measures,** including **money in pounds and pence** (appears also in Comparing)	use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling.	solve problems involving the calculation and conversion of **units of measure**, using decimal notation up to three decimal places where appropriate (appears also in Converting)
				measure the **perimeter** of simple 2-D shapes	measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the **perimeter** of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different **perimeters** and vice versa

<table>
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<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td></td><td></td><td rowspan="2">recognise and know the value of different denominations of coins and notes</td><td>recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</td><td rowspan="2">add and subtract amounts of money to give change, using both £ and p in practical contexts</td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td></td><td></td><td>find different combinations of coins that equal the same amounts of money</td></tr>
<tr><td></td><td></td><td></td><td>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>find the area of rectilinear</td><td>calculate and compare the area of squares and</td><td>calculate the area of parallelograms and triangles</td></tr>
</table>

					shapes by counting squares	rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes *recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})* (copied from Multiplication and Division)	calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g., mm^3 and km^3]. recognise when it is possible to use formulae for area and volume of shapes

TELLING THE TIME							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then…'		tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)		
		recognise and use language relating to dates, including days of the week, weeks, months and years	know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as			

				a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)			
					solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	

CONVERTING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)	know the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	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
					read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
					solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres

Geometry: Properties of Shapes

<table>
<tr><th colspan="8">IDENTIFYING SHAPES AND THIER PROPERTIES</th></tr>
<tr><th>Nursery</th><th>Reception</th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td>Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: ‘sides’, ‘corners’, ‘straight’, ‘flat’, ‘round’.</td><td>Select, rotate and manipulate shapes in order to develop spatial reasoning skills.</td><td rowspan="4">recognise and name common 2-D and 3-D shapes, including:
* 2-D shapes [e.g. rectangles (including squares), circles and triangles]
* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].</td><td>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</td><td rowspan="4"></td><td rowspan="4">identify lines of symmetry in 2-D shapes presented in different orientations</td><td rowspan="4">identify 3-D shapes, including cubes and other cuboids, from 2-D representations</td><td>recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)</td></tr>
<tr><td>Select shapes appropriately: flat surfaces for a building, a triangular pattern for a roof, etc.</td><td></td><td>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</td><td rowspan="3">illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</td></tr>
<tr><td>Combine shapes to make new ones – an arch, a bigger triangle, etc.</td><td></td><td rowspan="2">identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</td></tr>
<tr><td></td><td></td></tr>
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DRAWING AND CONSTRUCTING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	complete a simple symmetric figure with respect to a specific line of symmetry	draw given angles, and measure them in degrees (^{o})	draw 2-D shapes using given dimensions and angles
							recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)

COMPARING AND CLASSIFYING							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Compose and decompose shapes so that children can recognise a shape can have other shapes within it, just as numbers can.		compare and sort common 2-D and 3-D shapes and everyday objects		compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
						distinguish between regular and irregular polygons based on reasoning about equal sides and angles	

ANGLES							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				recognise angles as a property of shape or a description of a turn		know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
				identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	identify acute and obtuse angles and compare and order angles up to two right angles by size	identify: * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and ½ a turn (total 180°) * other multiples of 90°	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
				identify horizontal and			

				vertical lines and pairs of perpendicular and parallel lines			

Geometry: Position and Direction

POSITION, DIRECTION AND MOVEMENT							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understand position through words alone – for example, "The bag is under the table," – with no pointing.	Draw information from a simple map.	describe position, direction and movement, including half, quarter and three-quarter turns.	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		describe positions on a 2-D grid as coordinates in the first quadrant	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)
Describe a familiar route.					describe movements between positions as translations of a given unit to the left/right and up/down		draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Discuss routes and locations, using words like 'in front of' and 'behind'.							
					plot specified points and draw sides to		

					complete a given polygon		

PATTERN							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Talk about and identify the patterns around them. For example, stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.	Continue, copy and create repeating patterns.		order and arrange combinations of mathematical objects in patterns and sequences				
Extend and create ABAB patterns – stick, leaf, stick, leaf.							
Notice and correct an error in a repeating pattern.							

Statistics

INTERPRETING, CONSTRUCTING AND PRESENTING DATA							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Experiment with their own symbols and marks, as well as numerals.			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
			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				

SOLVING PROBLEMS							
Nursery	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				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 an average