Moretonhampstead Primary School

Mathematics Curriculum Statement

This Curriculum statement is designed to be used as a supportive tool to plan teaching and learning across our school.

The key skills are derived from the National Curriculum and spilt into individual year groups to support a progressive approach and mixed age classes.

Mathematics at Moretonhampstead Primary School

Our core purpose is to equip all pupils with the skills and confidence to develop their mathematical fluency, problem solving and reasoning in preparation for assessment (including statutory testing), further education and life beyond.

Children are encouraged to develop curiosity about number and embrace the mathematics that surrounds them each day in a variety of contexts that have meaningful connections to real life, including links with other curriculum subjects. We offer opportunities for children to develop understanding and mathematical articulacy through a cohesive progression of learning across the school in order to maximise their depth of learning. Children should be able to demonstrate a deep conceptual understanding of an area of maths and build on this over time, as well as establishing a secure knowledge of key number facts to allow them to become efficient mathematicians.

Mathematics is an opportunity for pupils to take risks, challenge themselves and work both independently and collaboratively towards solving problems. Children will develop concise and accurate vocabulary in mathematics through consistent modelling by teachers and high expectations for the pupils.

Our 'learning powers' (resilience, resourcefulness, reciprocity and reflectiveness) are evident throughout mathematics. Alongside this, we promote growth mindset and ensure all children feel empowered to achieve. This supports our children to develop self-confidence when faced with mathematical challenges, allowing them to embrace mistakes as part of the learning process and in turn value the importance of effort.

We strive to accelerate progress and improve outcomes for all of our pupils each year.

Vocabulary

Children's command of vocabulary is fundamental to learning and progress across the curriculum. Vocabulary is developed actively, building systematically on pupil's current knowledge and deepening their understanding of etymology and morphology (word origins and structures) to increase their store of words. Simultaneously, pupils make links between known and new vocabulary, and discuss and apply shades of meaning. In this way, children expand the vocabulary choices that are available to them. It is essential to introduce technical vocabulary which define each curriculum subject.

Vocabulary development is underpinned by an oracy culture and a tiered approach. High value is placed on the conscious, purposeful selection of well-chosen vocabulary and appropriate sentence structure to enrich access to learning and feed into written work across the curriculum.

- Our mathematics curriculum is based on the National Curriculum 2014 for Key Stages One and Two and the EYFS Framework. Our long term planning sets out where these objectives will be covered across the academic year.

- Staff will begin units of work with an **elicitation task**. These tasks will be in the form of questions exploring fluency, reasoning and problem solving. These tasks will provide staff with a clear picture of children's knowledge and skills which allows staff to meet need and extend children's learning from their individual starting points.

- New content is taught through small steps to support children in their learning journey which progresses into supported and independent practice for children to embed their new skills. Our planning aims to make learning challenging and enjoyable whilst ensuring continuity and progression across all year groups and key stages.   We use the White Rose Materials to support planning and to map out learning across the academic year. Teachers also supplement this scheme with other resources as appropriate for their class.

- Confidence in **fluency** is vital alongside **reasoning** and **problem solving.** Children need to be confident in all three of these National Curriculum aims before they can be assessed as having mastered a concept. We believe that a pupil really understands a mathematical concept, idea or technique if they can…

  · describe it in their own words
  · explain it to someone else
  · represent it in a variety of ways
  · make up their own examples of it
  · see connections between it and other facts or ideas
  · make use of it in various ways, including new situations.

- At Moretonhampstead, we recognise that reasoning may be demonstrated in different ways and does not always need to be captured in written form. We strive to help children develop their reasoning orally using precise mathematical language and encouraging children to **'talk like a mathematician.'** This is modelled and practised both by teachers and pupils during their maths sessions and supported by the use of STEM sentences and the vocabulary on the working wall.

- The focus on 'maths talk' is evident with talk partners and whole-class discussions in response to frequent questioning throughout all maths lessons. Teachers will challenge understanding through regular, investigative questioning throughout maths lessons, for example: How do you know? Can you prove it? Are you sure? What's the value? What's the same/different about? Can you explain that? What does your partner think? Can you show me another way?

- In EYFS and Key Stage One, teachers may scribe for children or annotate reasoning tasks to evidence their understanding. As our children progress through the school, there will be more evidence of written reasoning in their maths books. We expect all children to take pride in the work they produce and for teachers to have high expectations of presentation; one digit, one square should be practised from year 1 onwards.

- Mathematics is taught as a discrete subject but children are also challenged with real life problems so that they are made aware of the importance and relevance of mathematics in their everyday life. To develop cross curricular links, we carry out at least one STEM project each term to promote the use of mathematics alongside science and engineering. We also create opportunities for our children to use their maths skills where appropriate in other curriculum areas; for example, graphing in science or co-ordinates in geography.

- Regular, short times-tables activities take place in each class either during or before a maths lesson. All children from Year 1 upwards have access to Times Tables Rockstars (TTR), a web-based multiplication program which children can access both at home and school. All classes set table practice as part of home learning and KS2 classes use TTR for weekly times table practice as a class. Year 4 pupils practice for their MTC number of times each week and monitor progression on individual score sheets.

- There are regular '5-a-Day' sessions to provide focused opportunities for children to become fluent in the fundamentals of mathematics and related vocabulary and a further opportunity to reinforce basic concepts. Five a day is also used to address common misconceptions identified in previous lessons thus increasing the likelihood of rapid progress.

- In all year groups, we place a strong emphasis on children developing their conceptual understanding. We do this by following the CPA approach (below) This ensures conceptual understanding is secure, that our children are used to different representations and they are confident in selecting and using equipment appropriately to support their learning.

    - **Concrete** – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.
    - **Pictorial** – children then build on this concrete approach by using pictorial representations and images which can then be used to reason and solve problems.
    - **Abstract** – with the foundations firmly laid, children can move to an abstract approach using numbers and symbols with confidence.

- Our 'Calculation Policies' for EYFS, KS1, LKS2 and UKS2 provide progression in images, equipment and strategies in the four rules of number which are built on in Moretonhampstead from year to year and ensures that children are continually building on their prior knowledge.

- Each class has a mathematics working wall to support learning in mathematics. It is an evolving display of the current learning and builds up as a unit of work progresses. The wall supports children's independent work as vocabulary for the current topic is displayed alongside key resources. For example: shared work, teacher flipchart pages, images, numbers and symbols and stem sentences to support the development of oral reasoning.

- All children are expected to complete weekly mathematics homework. This to ensure continuity between home and school and to allow children to consolidate and focus on areas directly linked to their learning in class.

- We recognise that immediate 'verbal feedback' is a powerful tool to enable our children to identify to make progress and this is an integral part of lessons and also supports our staff work-life balance by reducing the amount of written marking undertaken. By using our marking policy, it will be clear to see that work to be revisited by pupils will be marked in orange, teacher comments or intervention in a book will be marked in green and pupils will use purple pen to respond to feedback or to revisit work. Verbal feedback is indicated by VF.

- We use **CAPED** as a way of feeding back to children about their work and adding extra challenge lesson. Children will typically respond to CAPED feedback using a purple polish pen or verbally as part of a discussion.

C	Check it
A	Another way
P	Prove it
E	Explain your thinking
D	Draw it

  C – Check (pupils encouraged to correct mistakes)
  A – Another Way (pupils to show their learning or calculate problem in a different way)
  P – Prove It (pupils encouraged to prove there answer is correct)
  E – Explain (pupils to use reasoning and mathematical language to explain their maths)
  D – Draw (pupils to a method of 'drawing' their maths. Bar modelling, number line etc.)

- We recognise the importance of addressing misconceptions quickly through our day to day formative assessment of children's work. Where misconceptions are identified, teachers intervene quickly to ensure these misconceptions are addressed to ensure good progress and that these are not repeated time after time with interventions. More specific interventions may be used for those children who are working below their expected level of attainment and progress.

In order to assess impact - a guide

Children will develop 'maths capital' - confidence, understanding and enjoyment in mathematics along with a comprehensive set of problem-solving skills and strategies to take with them to the next stage of their education. They will be engaged, resilient, challenged and able to quickly recall facts and techniques in order to maximise their depth of learning.

They will use mathematics effectively as a tool in a wide variety of situations and will be able to present a justification or argument relating to a problem using mathematical language. They will understand the relevance of what they are learning in relation to real world concepts and develop a sense of curiosity about the subject.

Our children will develop confident recall of multiplication tables to 12x12 by the end of year 4 and our attainment data will exceed national.

Assessment evidence - a guide

KS1	Years 3-5	Year 6
Statutory tests for Year 2 (SATs)	Statutory Multiplication Check for Year 4	Statutory tests for Year 6 (SATs)
SIMs – in-house data and progress tracking	Non-statutory evidence gathering grids for moderation (Babcock)	SIMs – in-house data and progress tracking
Teacher assessment - observations of maths behaviour and discussion	SIMs – in-house data and progress tracking	Teacher assessment - observations of maths behaviour and discussion
Maths books	Teacher assessment - observations of maths behaviour and discussion	Maths books
TTRS	Maths books	TTRS
Elicitation tasks	TTRS	Written responses to CAPED and activities across the curriculum
Written responses to CAPED and activities across the curriculum	Written responses to CAPED and activities across the curriculum	

Progressive curriculum plan

Number and place value/ Counting

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
given a number, identify one more and one less		find 10 or 100 more or less than a given number	find 1000 more or less than a given number		

Comparing numbers

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 1000	order and compare numbers beyond 1000	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)
			compare numbers with the same number of decimal places up to two decimal places (copied from Fractions)		

Identifying, representing and estimating numbers

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line	identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		

Reading and writing numbers (including Roman numerals)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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 1000 in numerals and in words		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, write, order and compare numbers up to 10 000 000 and determine the value of each digit *(appears also in Understanding Place Value)*
		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 Roman numerals to 1000 (M) and recognise years written in Roman numerals.	

Understanding place value

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	recognise the place value of each digit in a two-digit number (tens, ones)	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	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)*
			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)	*recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)*	*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)*

Rounding

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

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	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

Addition and subtraction

Number bonds

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				

Addition and subtraction
Mental calculation

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

Written methods

read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs *(appears also in Mental Calculation)*		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)	

Inverse operations, estimating and checking answers

	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.

Problem solving

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 problems involving addition, subtraction, multiplication and division

Multiplication and division						
Multiplication and division facts					
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 1000 (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					
		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 numbers	multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		recognise and use factor pairs and commutativity in mental calculations *(appears also in Properties of Numbers)*	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	*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					
	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)
Properties of numbers: multiples, factors, primes, square and cube numbers					
			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
				know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	*use common factors to simplify fractions; use common multiples to express fractions in the same denomination (copied from Fractions)*
				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)*
Order of operations					
					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

Problem solving					
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	solve problems involving addition, subtraction, multiplication and division
				solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	
				solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	*solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)*

Fractions, decimals and percentages					
Counting in fractional steps					
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 the 1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)	count up and down in tenths	count up and down in hundredths		
Recognising fractions					
recognise, find and name a half as one of two equal parts of an object, shape or quantity	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents *(appears also in Equivalence)*	

		recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
recognise, find and name a quarter as one of four equal parts of an object, shape or quantity		recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
Comparing fractions					
		compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1
Comparing decimals					
			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					
			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
Equivalence					
	write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
			recognise and write decimal equivalents of any number of tenths or hundredths	read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100}$) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
			recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$	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	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Addition and subtraction of fractions					
		add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
				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. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	
Multiplication and division of fractions					
				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. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)
					multiply one-digit numbers with up to two decimal places by whole numbers
	$\frac{1}{3} \div 2 = \frac{1}{6}$				divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)
Multiplication and division of decimals					
					multiply one-digit numbers with up to two decimal places by whole numbers
			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 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. $\frac{3}{8}$)
					use written division methods in cases where the answer has up to two decimal places

Problem solving					
		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 $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.	

Ratio and proportion					
					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 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
Equations

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
*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)*	*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)*	*solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction)* *solve problems, including missing number problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division)*		*use the properties of rectangles to deduce related facts and find missing lengths and angles (copied from Geometry: Properties of Shapes)*	express missing number problems algebraically
	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)				find pairs of numbers that satisfy number sentences involving two unknowns
represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)					enumerate all possibilities of combinations of two variables

Formulae

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

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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

Comparing and estimating					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
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, slower, earlier, later]	compare and order lengths, mass, volume/capacity and record the results using >, < and =		estimate, compare and calculate different measures, including money in pounds and pence *(also included in Measuring)*	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) estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water)	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.
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					
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

recognise and know the value of different denominations of coins and notes	recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	add and subtract amounts of money to give change, using both £ and p in practical contexts			
			find the area of rectilinear shapes by counting squares	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 *recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) (copied from Multiplication and Division)*	calculate the area of parallelograms and triangles
					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					
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					
	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 shape					
Identifying shapes and their properties					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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].	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line		identify lines of symmetry in 2-D shapes presented in different orientations	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets *(appears also in Drawing and Constructing)*
	identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces				illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]				
Drawing and constructing					
		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 ($^{\circ}$)	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					
	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					
		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

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

			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 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 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.
			plot specified points and draw sides to complete a given polygon		

Pattern

	order and arrange combinations of mathematical objects in patterns and sequences				

Statistics

Interpreting, constructing and presenting data

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	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

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