



Morchard Bishop C of E Primary School

Mathematics Curriculum Statement EYFS–Year 6

Mathematics at Morchard Bishop C of E 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 at The Link Academy Trust 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 in The Link Academy Trust. 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.

A mathematician at our school will

- become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

- be able solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- be able to communicate, justify, argue and prove using mathematical vocabulary.
- be able to use maths in other subjects across the curriculum, behaving like mathematicians.
- develop their character, including resilience, confidence and independence, so that they contribute positively to the life of the school, their local community and the wider environment.

Vocabulary

Children's command and application of vocabulary is fundamental to their learning and progress across the whole curriculum. Teachers develop vocabulary actively and specifically, building systematically on children's current knowledge and deepening their understanding of etymology and morphology (word origins and structures) in order to increase pupils' store of words. Simultaneously, pupils should also make links between known and new vocabulary and apply the shades of meaning in similar words. In this way, they will expand and apply vocabulary choices that are available to them.

Maths specific vocabulary

Rich maths vocabulary is modelled and discussed by class teachers and pupils. The expectations are high for children to consistently use accurate, concise and age-appropriate mathematical vocabulary during discussions and written reasoning. By the time Year 6 pupils undertake SATs, children should have a clear understanding of KS1 and KS2 maths vocabulary to eliminate potential barriers to understanding questions. Teachers use regular questioning and activities around maths vocabulary to address misconceptions and dual meanings. The vocabulary for the current topic is displayed in the classroom, alongside examples of children's work, images, numbers and symbols for the children to refer to and to support their learning. The focus on 'maths talk' is evident with talk

Planning

Maths mastery is a core driver of our teaching and learning. This method is complemented by fluency, problem-solving and reasoning tasks adapted from a variety of other sources. Lessons planned in all year groups adopt a Concrete-Pictorial-Abstract (CPA) approach to engage and add depth of understanding for all learners. The planning ensures that all learners are challenged at an appropriate level and support is allocated accordingly. Depending on class structure, as mixed-age classes dictate, some year groups may receive separate lesson inputs by the Teacher and/or TA and some will share lesson inputs, but all will have differentiation incorporated into each lesson. Medium-term Rising Stars planning maps out curriculum coverage.

Lesson structure and class management

The focus on 'maths talk' is evident with talk partners, talk trios or whole-class discussions in response to frequent questioning throughout all maths lessons. Teachers will challenge understanding through regular, investigative questioning throughout, for example: How do you know? What method have you used? 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? Maths pairs and trios are selected each week so children work with a range of other learners. Lessons typically begin with independent fluency tasks. This provides daily opportunities to recap core mathematical understanding and address misconceptions. A

Working walls and resources

Each class has a mathematics working wall to support learning in mathematics. It is a public display of the learning process which evolves as each day progresses to support children's independent work. Children know where maths resources are kept and are encouraged to independently use them to assist their own learning. A range of maths scaffolding resources are used by individuals identified as requiring them. Children are all able to access MyMaths and MathShed as a means to improving their understanding and fluency.

<p>partners, talk trios or whole-class discussions in response to frequent effective questioning throughout all maths lessons. By giving the children these opportunities expand on their thinking and share their reasoning, they will develop their conceptual understanding and make connections between number facts.</p>	<p>The use of manipulatives continues throughout the Primary curriculum to support learning new concepts as well as supporting children who are working below the age-related expectations.</p>	<p>'recap' question then follows – this is the 'review' question from the previous lesson. The main body of the lesson will include concrete, pictorial and abstract forms of mathematical learning and opportunities to develop fluency, problem-solving and reasoning.</p>	
<p>Self-editing & feedback Children will typically respond to feedback using a purple pen or verbally as part of a discussion. Pink marking pens are used to show that their work is correct, green shows that their work requires corrections. (Perfect Pink and Growing Green)</p> <p>KS2 pupils may mark work together to provide opportunities to discuss understanding and instant feedback to assist in gauging understanding. Lessons conclude with a 'review' question which is a five-minute discussion to reflect upon the learning of the lesson without written maths taking place.</p>	<p>Times tables 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 MathShed, 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 have a weekly times table practice in their class. Year 4 pupils practice for their MTC on iPads a number of times each week and monitor progression on individual score sheets.</p>	<p>SEND, pre-teaching and mop-up maths Some individuals are specifically supported by additional adults, resources or differentiated activities in maths. Learners who have not kept up with the rest of the class during the lesson also have an opportunity for 'Maths Intervention' sessions with their teacher or TA every week. Intervention for pupils working significantly below age-related expectation is detailed in Class Provision Maps.</p>	<p>Calculation policy This calculation policy is a guide for teaching the progression of calculation strategies throughout primary education at Morchard Bishop but does not consider any strategy to be specific for use only in particular year groups. An example of this is pupils using basic number lines in Year 6 to solve negative number problems or the basic use of visual and concrete representations of number across all year groups.</p>
<p>Assessment - in order to assess impact</p>			
<p>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.</p>			

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.

Morchard Bishop uses NFER termly assessments to monitor progress, as well as areas that need re-teaching.

Assessment evidence - a guide

EYFS	KS1	Years 3-5	Year 6
<p>Observations of maths behaviour including through Maths Mastery, Tapestry and White Rose?</p> <p>Talking to pupils and parents.</p> <p>Maths books/evidence</p> <p>Ongoing observations and assessments</p>	<p>Statutory tests for Year 2 (SATs)</p> <p>SIMs – in-house data and progress tracking</p> <p>Teacher assessment - observations of maths behaviour and discussion</p> <p>Maths books</p> <p>NFER Assessments</p> <p>Elicitation tasks</p> <p>Written responses to activities across the curriculum.</p>	<p>Non-statutory evidence gathering grids for moderation (Babcock)</p> <p>SIMs – in-house data and progress tracking</p> <p>Teacher assessment - observations of maths behaviour and discussion</p> <p>Maths books</p> <p>NFER Assessments</p> <p>Written responses to activities across the curriculum.</p>	<p>Statutory tests for Year 6 (SATs)</p> <p>SIMs – in-house data and progress tracking</p> <p>Teacher assessment - observations of maths behaviour and discussion</p> <p>Maths books</p> <p>NFER Assessments</p> <p>Written responses to activities across the curriculum.</p>

Progressive curriculum plan

Number and place value/ Counting

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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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 1 000	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 1 000 more or less than a given number		

Comparing numbers

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

Identifying, representing and estimating numbers

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		
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Reading and writing numbers (including Roman numerals)

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		read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (<i>appears also in Comparing Numbers</i>)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (<i>appears also in Understanding Place Value</i>)
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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 1 000 (M) and recognise years written in Roman numerals.

Understanding place value

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 1 000 where the answers are up to three decimal places (copied from Fractions)

Rounding

round any number to the nearest 10, 100 or 1 000

round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000

round any whole number to a required degree of accuracy

round decimals with 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

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

solve number problems and practical problems that involve all of the above

solve number and practical problems that involve all of the above

above and with increasingly large positive numbers

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: <ol style="list-style-type: none"> 1. a two-digit number and ones 2. a two-digit number and tens 3. two two-digit numbers 4. adding three one-digit numbers 	add and subtract numbers mentally, including: <ol style="list-style-type: none"> 5. a three-digit number and ones 6. a three-digit number and tens 7. 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
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read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (<i>appears also in Written Methods</i>)	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
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Written methods

read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (<i>appears also in Mental Calculation</i>)		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)	
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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.
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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: 8. using concrete objects and pictorial representations, including those involving numbers, quantities and measures 9. 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
<i>count in multiples of twos, fives and tens (copied from Number and Place Value)</i>	<i>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)</i>	<i>count from 0 in multiples of 4, 8, 50 and 100 (copied from Number and Place Value)</i>	<i>count in multiples of 6, 7, 9, 25 and 1 000 (copied from Number and Place Value)</i>	<i>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)</i>	
	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 (<i>appears also in Written Methods</i>)	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 (<i>appears also in Properties of Numbers</i>)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) (copied from Fractions)</i>

Written calculation

	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) 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 (<i>appears also in Mental Methods</i>)	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
					<i>use written division methods in cases where the answer has up to two decimal places (copied from Fractions)</i>

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	<i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination (copied from Fractions)</i>
				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)	<i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units such as mm³ and km³ (copied from Measures)</i>
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					
		<i>estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)</i>	<i>estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)</i>		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	<i>solve problems involving similar shapes where the scale factor is known or can be found</i> <i>(copied from Ratio and Proportion)</i>
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Fractions, decimals and percentages

Counting in fractional steps

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<i>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)</i>	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 (<i>appears also in Equivalence</i>)	
		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

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
<p><i>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)</i></p>	<p><i>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)</i></p>	<p><i>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction)</i></p>		<p><i>use the properties of rectangles to deduce related facts and find missing lengths and angles</i></p> <p><i>(copied from Geometry: Properties of Shapes)</i></p>	<p>express missing number problems algebraically</p>
		<p><i>solve problems, including missing number problems, involving multiplication and division, including integer scaling</i></p> <p><i>(copied from Multiplication and Division)</i></p>			

	<i>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)</i>				find pairs of numbers that satisfy number sentences involving two unknowns
<i>represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)</i>					enumerate all possibilities of combinations of two variables

Formulae

			<i>Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit. (Copied from NSG measurement)</i>		use simple formulae
					<i>recognise when it is possible to use formulae for area and volume of shapes (copied from Measurement)</i>

Sequences

<i>sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (copied from Measurement)</i>	<i>compare and sequence intervals of time (copied from Measurement)</i>				generate and describe linear number sequences
	<i>order and arrange combinations of mathematical objects in patterns (copied from Geometry: position and direction)</i>				

Measurement

Comparing and estimating

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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<p>compare, describe and solve practical problems for:</p> <ol style="list-style-type: none"> 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] 	<p>compare and order lengths, mass, volume/capacity and record the results using >, < and =</p>		<p>estimate, compare and calculate different measures, including money in pounds and pence</p> <p><i>(also included in Measuring)</i></p>	<p>calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes (also included in measuring)</p> <p>estimate volume (e.g. using 1 cm³ blocks to build cubes and cuboids) and capacity (e.g. using water)</p>	<p>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units such as mm³ and km³.</p>
<p>sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p>	<p>compare and sequence intervals of time</p>	<p>compare durations of events, for example to calculate the time taken by particular events or tasks</p>			
		<p>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 (<i>appears also in Telling the Time</i>)</p>			

Measuring and calculating

<p>measure and begin to record the following:</p> <ol style="list-style-type: none"> 1. lengths and heights 2. mass/weight 3. capacity and volume 4. time (hours, minutes, seconds) 	<p>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</p>	<p>measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p>	<p>estimate, compare and calculate different measures, including money in pounds and pence</p> <p><i>(appears also in Comparing)</i></p>	<p>use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.</p>	<p>solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate</p> <p><i>(appears also in Converting)</i></p>
		<p>measure the perimeter of simple 2-D shapes</p>	<p>measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p>	<p>measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</p>	<p>recognise that shapes with the same areas can have different perimeters and vice versa</p>
<p>recognise and know the value of different denominations of coins and notes</p>	<p>recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</p> <p>find different combinations of coins that equal the same amounts of money</p> <p>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p>	<p>add and subtract amounts of money to give change, using both £ and p in practical contexts</p>			
			<p>find the area of rectilinear shapes by counting squares</p>	<p>calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes</p> <p><i>recognise and use square numbers and cube numbers, and the notation for squared (²)</i></p>	<p>calculate the area of parallelograms and triangles</p> <p>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [e.g. mm³ and km³].</p> <p>recognise when it is possible to use formulae for area and volume of shapes</p>

and cubed ⁽³⁾ (copied from
Multiplication and Division)

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;

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,

				gram and kilogram; litre and millilitre)	using decimal notation to up to three decimal places
			read, write and convert time between analogue and digital 12 and 24-hour clocks (<i>appears also in Converting</i>)	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 (<i>appears also in Measuring and Calculating</i>)
			solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (<i>appears also in Telling the Time</i>)	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: <ul style="list-style-type: none"> 5. 2-D shapes [e.g. rectangles (including squares), circles and triangles] 6. 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 (<i>appears also in Drawing and Constructing</i>)
	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

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:

1. angles at a point and one whole turn (total 360°)
2. angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°)

recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

				other multiples of 90°	
		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 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 movements between positions as translations of a given unit to the left/right and up/down		
			plot specified points and draw sides to complete a given polygon		

Pattern

	order and arrange combinations of mathematical objects in patterns and sequences				
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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

		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
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