The Nethersole CofE Academy
Mathematics Curriculum

Jesus said, 'You're here to be light, bringing out the God-colours in the world.' Matthew 5:16 *(The Message)*

The Nethersole CofE Academy Vision and Values

'Let Your Light Shine'
Our Christian Vision for everyone to be unique shining lights in God's world is illuminated by our biblically based **Christian Values** that we learn to radiate in our daily lives - in our attitudes, relationships, behaviour, choices and decisions.

Hope	Community	Dignity and Respect	Forgiveness	Wisdom	Thankfulness

Intent

Our curriculum intent at The Nethersole CofE Academy is to provide a broad, exciting, and challenging curriculum of the highest quality for the children in our care; encouraging, motivating and ensuring all children develop a love of learning, to achieve their full potential.

Implementation

Our curriculum will be implemented through knowledge-led experiences, enabling the children to increase their knowledge, learn and master new skills and therefore, deepen their understanding in a wide range of subjects.

Impact

The impact of this broad, exciting, and challenging curriculum is to inspire and motivate the young people in our care to become lifelong learners. We also provide a Christian community to enable all to value faith. All pupils are encouraged to be proud of their own culture, religion and language and show respect to those of others.

Our Vision

To be light (living in our community and reaching out beyond it) bringing out the God-colours in the world.'
Jesus said, 'You're here to be light, bringing out the God-colours in the world.' **Matthew 5:16**

The Nethersole Church of England Academy Primary School and Nursery has a Christian foundation that inspires its life and work. Following the teaching of Jesus, we accept the challenge - *'to be light [living in our community and reaching out beyond it], bringing out the God-colours in the world.' Matthew 5:16*
At the heart of our school is the belief that everyone is a child of God, fearfully and wonderfully made in his image. Our work therefore is to nurture and love every individual, child and adult, to find and develop their gifts, overcoming barriers and growing in confidence to **flourish** - to let their light shine as the very best God version of themselves. Effective teaching and learning underpin this. We wish to inspire everyone to take responsibility for creation, civilisation, and the well-being of each of other, embracing and treasuring our differences.
Our Christ led vision is for a world of justice, respect, and love, and of people who are not afraid to love and sacrifice themselves for others. Our inspiration is Jesus, who loves us in sacrifice, forgives us and reminds us that we each have something special to do to bring out the God colours of the world. We believe that there is a space for everyone to shine brightly and differently and that this adds to the richness of our school family, our community and the wider world.

Mathematics Long Term Plan

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Subitising and counting skills. Composition of numbers within 5. Compare sets of objects. Use the language of comparison.		Subitising and counting skills. Composition of numbers within 5 and beyond 5. Two sets are equal or unequal. Connect quantities to numerals.		Develop counting skills and counting larger numbers. Wider range of counting strategies. Secure knowledge of number facts.	
1	Number and Place Value - Previous Reception experiences and counting within 100	Number and Place Value - Comparison of quantities and part–whole relationships	Geometry - Recognise, compose, decompose and manipulate 2D and 3D shapes	Addition and Subtraction - Additive structures	Number and Place Value - Numbers 0 to 20	Number Facts - Unitising and coin recognition
1		Number and Place Value - Numbers 0 to 5	Number and Place Value - Numbers 0 to 10	Number Facts - Addition and subtraction facts within 10	Number and Place Value - Numbers 0 to 20	Shape, Space and Measure - Position and direction / Time
1		Addition and Subtraction	Addition and Subtraction - Additive structures		Number Facts - Unitising and coin recognition	
2	Number and Place Value - Numbers 10 to 100	Number Facts - Fluently add and subtract within 10	Multiplication and Division - Introduction to multiplication / Introduction to division structures	Geometry - Shape	Money	Multiplication and Division - doubling, halving, quotitive and partitive division
2		Addition and Subtraction - Addition and subtraction of two-digit numbers			Fractions	
2	Addition and Subtraction - Calculations within 20	Multiplication - Introduction to multiplication		Addition and Subtraction - Addition and	Shape, Space and Measure – Time / Position and direction	Shape, Space and Measure - capacity, volume, mass

				subtraction of two-digit numbers		
3	Addition and Subtraction - Adding and subtracting across 10 Number Facts - Adding and subtracting across 10 Number and Place Value - Numbers to 1,000 Addition and Subtraction - Numbers to 1,000	Addition and Subtraction - Numbers to 1,000 Number Facts - Numbers to 1,000 Other	Geometry - Right angles Addition and Subtraction - Manipulating the additive relationship and securing mental calculation	Addition - Column addition Multiplication - 2, 4, 8 times tables Number Facts - 2, 4, 8 times tables Subtraction - Column subtraction	Fractions - Unit fractions	Fractions - Non-unit fractions Shape, Space and Measure - Parallel and perpendicular sides in polygons / Time
4	Addition and Subtraction - Review of column addition and subtraction Number and Place Value - Numbers to 10,000 Number Facts - Numbers to 10,000	Geometry - Perimeter Number Facts - 3, 6, 9 times tables	Number Facts - 3, 6, 9 times tables Multiplication and Division - 7 times table and patterns	Multiplication and Division - 7 times table and patterns Number Facts - Understanding and manipulating multiplicative relationships Number Facts Geometry – Coordinates	Fractions - Review of fractions / Fractions greater than 1	Geometry - Symmetry in 2D shapes Shape, Space and Measure - Time Number Facts - Division with remainders

5	Number and Place Value - Decimal fractions	Number Facts - Negative numbers	Geometry - Area and scaling	Multiplication and Division - Calculating with decimal fractions / Factors, multiples and primes	Number and Place Value - Fractions	Shape, Space and Measure - Converting units / Angles
	Money	Multiplication and Division - Short multiplication and short division	Multiplication and Division - Calculating with decimal fractions		Fractions	
6	Addition and Subtraction - Calculating using knowledge of structures	Number and Place Value - Numbers up to 10,000,000	Addition and Subtraction - Multiplication and division	Fractions and Percentages -	Statistics Key Stage 2 SATs	Ratio and proportion / Calculating using knowledge of structures / Solving problems with two unknowns / Order of operations / Mean average
			Multiplication and Division			
	Multiplication and Division - Multiples of 1,000	Geometry - Draw, compose and decompose shapes	Shape, Space and Measure - Area, perimeter, position and direction			

What is Mathematics?

Mathematics overview adapted from the NC Purpose & Aims

National Curriculum – Purpose of Study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology, and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

The National Curriculum for Mathematics aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics, including 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.
- Can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects. The expectation is that most pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Spoken Language

The National Curriculum for Mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially, and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument, or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

EYFS Definition – The first few years of a child's life are especially important for mathematics development. Research shows that early mathematical knowledge predicts later reading ability and general education and social progress. Conversely, children who start behind in mathematics tend to stay behind throughout their whole educational journey.

The objective for those working in Early Years, then, is to ensure that all children develop firm mathematical foundations in a way that is engaging, and appropriate for their age.

There are six key areas of early mathematics learning, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school, and beyond:

Cardinality and Counting -

Understanding that the cardinal value of a number refers to the quantity, or 'howmanyness' of things it represents.

Comparison

Understanding that comparing numbers involves knowing which numbers are worth more or less than each other.

Composition

Understanding that one number can be made up from (composed from) two or more smaller numbers.

Pattern

Looking for and finding patterns helps children notice and understand mathematical relationships.

Shape and Space

Understanding what happens when shapes move, or combine with other shapes, helps develop wider mathematical thinking.

Measures

Comparing different aspects such as length, weight and volume, as a preliminary to using units to compare later.

An **EYFS** Mathematics Educational Programme must involve activities and experiences for children as follows –

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space, and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Early Learning Goal – **Number -**
Children at the expected level of development will: - Have a deep understanding of number to 10, including the composition of each number; Subitise (recognise quantities without counting) up to 5; Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Early Learning Goal - **Numerical Patterns -**
Children at the expected level of development will - Verbally count beyond 20, recognising the pattern of the counting system; Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Key Stage 1 – Years 1 and 2 –

The principal focus of Mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources, for example, concrete objects and measuring tools. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity / volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2 – Years 3 and 4 –

The principal focus of Mathematics teaching in Lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2 – Years 5 and 6 –

The principal focus of Mathematics teaching in Upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages, and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals, and percentages. Pupils should read, spell, and pronounce mathematical vocabulary correctly.
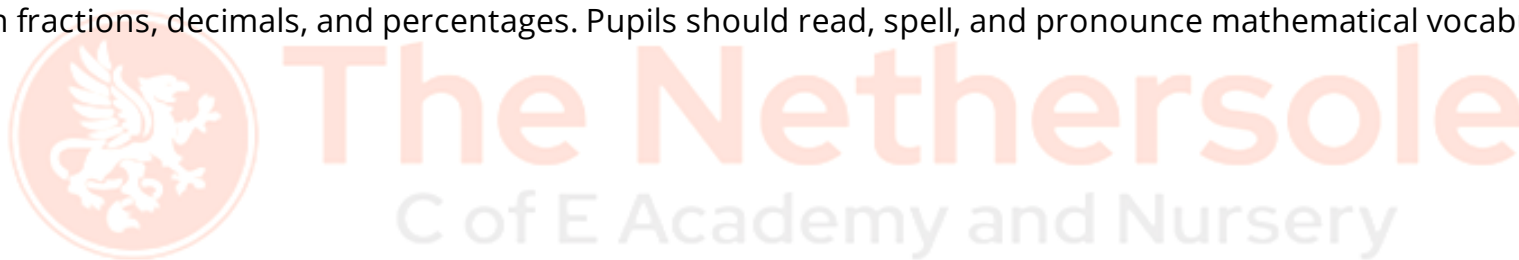
The following tables are adapted from the National Curriculum – Ready to Progress Criteria -

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	NUMBER AND PLACE VALUE - COUNTING					
	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.		
NUMBER AND PLACE VALUE - 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 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)		
NUMBER AND PLACE VALUE – IDENTIFYING, REPRESENTING & 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.		
NUMBER AND PLACE VALUE - READING AND WRITING NUMBERS (incl 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 1000 in numerals and in words.	Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include	Read, write, order and compare numbers to at least 1 000 000 and	Read, write, order and compare numbers up to 10 000 000 and

			the concept of zero and place value.	determine the value of each digit.	determine the value of each digit.
		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 Roman numerals to 1000 (M) and recognise years written in Roman numerals.	

NUMBER AND PLACE VALUE - 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.	Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.
			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.	*Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.*	*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.*

NUMBER AND PLACE VALUE – 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.	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.

NUMBER AND PLACE VALUE – 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 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.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		NUMBER: ADDITION AND SUBTRACTION – NUMBER BONDS			
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.				

NUMBER: ADDITION AND SUBTRACTION – MENTAL CALCULATIONS					
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.	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.
NUMBER: ADDITION AND SUBTRACTION – WRITTEN METHODS					

Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.		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.		

NUMBER: 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.

NUMBER: ADDITION AND SUBTRACTION – 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.
	Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.				

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NUMBER: MULTIPLICATION AND DIVISION FACTS					
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.*	
	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.		
NUMBER: MULTIPLICATION AND DIVISION – MENTAL CALCULATIONS					
		Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times	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.

		one-digit numbers, using mental and progressing to formal written methods.			
	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.	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. $^3/_8$)*
NUMBER: MULTIPLICATION AND DIVISION – 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	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.

| | | | mental and progressing to formal written methods. | | 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.* |

NUMBER: MULTIPLICATION & DIVISION – MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS

| | | | Recognise and use factor pairs and commutativity in mental calculations. | 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.*
				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*
NUMBER: MULTIPLICATION & DIVISION - ORDER OF OPERATIONS					
					Use their knowledge of the order of operations to carry out calculations involving the four operations.
NUMBER: MULTIPLICATION AND DIVISION – INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS					
		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 estimation to check answers to calculations and determine, in the

					context of a problem, levels of accuracy
NUMBER: MULTIPLICATION AND DIVISION – 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 objects are connected to 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.	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 equal's 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.*

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			NUMBER: FRACTIONS – COUNTING IN FRACTIONAL STEPS			
		Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)	Count up and down in tenths.	Count up and down in hundredths.		
			NUMBER: FRACTIONS – RECOGNISING FRACTIONS			
	Recognise, find and name a half as one of two equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	Recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ 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 tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. Recognise and use fractions as numbers: 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.	

NUMBER: FRACTIONS – 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

NUMBER: FRACTIONS – 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.

NUMBER: FRACTIONS – 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.

NUMBER: FRACTIONS – EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS & PERCENTAGES)					
	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,	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

				including tenths and hundredths.	
			Recognise and write decimal equivalents of any number of tenths or hundredth.	Read and write decimal numbers as fractions (e.g. $0.71 = {}^{71}/_{100}$)	Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ${}^{3}/_{8}$)
				Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	
			Recognise and write decimal equivalents to ${}^{1}/_{4}; {}^{1}/_{2}; {}^{3}/_{4}$	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.
NUMBER: FRCATIONS – ADDITION AND SUBTRACTION					
		Add and subtract fractions with the same denominator within one whole (e.g. ${}^{5}/_{7} + {}^{1}/_{7} = {}^{6}/_{7}$)	Add and subtract fractions with the same denominator.	Add and subtract fractions with the same denominator and multiples of the same number.	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. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5}$ $= 1\frac{1}{5}$)	
NUMBER:FRACTIONS – MULTIPLICATION & DIVISION					
				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. $\frac{1}{3} \div 2 = \frac{1}{6}$)
NUMBER: FRACTIONS – MULTIPLICATION & 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. $^3/_8$)
					Use written division methods in cases where the answer has up to two decimal places.
NUMBER: FRACTIONS – 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 $^1/_2$, $^1/_4$, $^1/_5$, $^2/_5$, $^4/_5$ and those with a	

					denominator of a multiple of 10 or 25.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
RATIO AND PROPORTION **Statements only appear in Year 6 but should be connected to previous learning, particularly fractions, multiplication & division.**					
					Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
					Solve problems involving the calculation of percentages. For example, of measures, and such as 15% of 360 and the use of percentages for comparison.
					Solve problems involving similar shapes where the scale factor is known or can be found.
					Solve problems involving unequal sharing and grouping using

					knowledge of fractions and multiples.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MEASUREMENT: COMPARING AND ESTIMATING					
Compare, describe, and solve practical problems for: * lengths and heights. For example - long/short, longer/shorter, tall/short, double/half. * mass/weightz. For example - heavy/light, heavier than, lighter than. * Capacity and volume. For example - full/empty, more than, less than, half, half full, quarter. * Time. For example - 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.	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. 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. For example -	Compare and sequence intervals of time.	Compare durations of events, for example to			

before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.		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.			
MEASUREMENT: 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.**	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.
		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.	Add and subtract amounts of **money** to give change, using both £ and p in practical contexts.			

	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.				
			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 $(^3)$*	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. For example, mm^3 and km^3

					Recognise when it is possible to use formulae for area and volume of shapes.
MEASUREMENT: 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.		
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.	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.			
			Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Solve problems involving converting between units of time.	

MEASUREMENT: CONVERTING					
	Know the number of minutes in an hour and the number of hours in a day.	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;	Use, read, write and convert between standard units, converting

				centimetre and millimetre; gram and kilogram; litre and millilitre)	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.	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.
			Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Understand and use equivalences between metric units and common imperial units such as inches, pounds, and pints.	Convert between miles and kilometres.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
GEOMETRY: PROPERTIES OF SHAPES – IDENTIFYING SHAPES AND THEIR PROPERTIES					
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 and describe the properties of 3-D shapes, including the number of edges, vertices, and faces. Identify 2-D shapes on the surface of 3-D shapes. For example, a circle on a cylinder and a triangle on a pyramid.		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. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.
GEOMETRY: PROPERTIES OF SHAPES – DRAWING AND CONSTRUCTING					
		Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different	Complete a simple symmetric figure with respect to a specific line of symmetry.	Draw given angles, and measure them in degrees (^{o})	Draw 2-D shapes using given dimensions and angles.

		orientations and describe them.			Recognise, describe and build simple 3-D shapes, including making nets.
GEOMETRY: PROPERTIES OF SHAPES – 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.	
GEOMETRY: PROPERTIES OF SHAPES – 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. | | | |

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
GEOMETRY: POSITION AND DIRECTION – POSITION, DIRECTION AND MOVEMENT					
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.		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.		
GEOMETRY: POSITION AND DIRECTION - PATTERN					
	Order and arrange combinations of mathematical objects in patterns and sequences.				

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		STATISTICS – INTERPRETING, CONSTRUCTING AND PRESENTING DATA			
	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.				
		STATISTICS – SOLVING PROBLEMS			
		Solve one-step and two-step questions. For example, '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.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			ALGEBRA - EQUATIONS			
	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and **missing number problems** *such as 7 = □ - 9*	*Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and* **missing number** *problems.*	*Solve problems, including* **missing number** *problems, using number facts, place value, and more complex addition and subtraction.*		*Use the properties of rectangles to deduce related facts and find* **missing lengths and angles.**	Express missing number problems algebraically.
			Solve problems, including **missing number** *problems, involving multiplication and division, including integer scaling.*			
		Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.				Find pairs of numbers that satisfy number sentences involving two unknowns.
	Represent and use number bonds and related subtraction facts within 20.					Enumerate all possibilities of combinations of two.
			ALGEBRA - FORMULAE			
				Perimeter can be expressed algebraically as 2(a + b)		Use simple formulae.

			where a and b are the dimensions in the same unit.		Recognise when it is possible to use **formulae** for area and volume of shapes
ALGEBRA - SEQUENCES					
Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.	*Compare and sequence intervals of time.* *Order and arrange combinations of mathematical objects in patterns.*				Generate and describe linear number sequences.

All programmes of study statements are included, and some appear twice (*shown in italics.*)

This occurs where:

- The statement has central relevance to more than one subcategory within a topic.

- The statement has central relevance to more than one mathematics topic.

This is done to reflect the aims of the curriculum that *pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems* (Mathematics programmes of study: key stages 1 and 2 page 3).