Mathematics – Whole School Progression Map

Discovery MAT – Maths Curriculum Statement

Quote that guide us:

'Pure mathematics is, in its way, the poetry of logical ideas.' Albert Einstein

'We will always have STEM with us. Some things will drop out of the public eye and go away, but there will always be science, engineering, and technology. And there will always, always be mathematics.' Katherine Johnson (African-American mathematician)

Why is it important to teach Mathematics? (Intent)

At Discovery Multi-Academy Trust we are dedicated to ensuring that children are able to distinguish the importance of Mathematics in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives in a range of diverse contexts. We want all children to enjoy Mathematics and to experience success in the subject, with the ability to reason mathematically in both Maths and other subjects across the curriculum. We are committed to developing children's curiosity about the subject, as well as an appreciation of the beauty and power of Mathematics.

Key Concepts:

- Number (Number and Place Value; Addition and Subtraction; Multiplication and Division; Fractions.)
- Measurement
- Geometry (Properties of Shapes; Position and Direction.)
- Statistics

Curriculum Design (Implementation)

Each school within the Trust follows the National Curriculum for Mathematics. The National Curriculum for Maths aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical language.
- Problem solve by applying knowledge to a variety of routine and non-routine problems breaking down problems into simpler steps and persevering in answering

Teachers follow the National Curriculum to ensure that Maths objectives are covered during their timetabled lessons. A wide range of resources are also used to support the teaching of Maths, including White Rose and NCETM.

Multiplication tables are a focus (within school and at home) for KS2 pupils and in KS1 number facts are taught and practised to support with this.

Each year group are allocated Key Instant Recall Facts (known as KIRFs) to focus on throughout the year, in line with age related expectations. KIRFs are key pieces of mathematical knowledge for pupils to learn off-by-heart, or to be able to work out very quickly (within 3 seconds). They are designed to support the development of the mental skills that underpin mathematics. KIRFs are particularly useful for calculations, whether adding, subtracting, multiplying or dividing. They include facts such as number bonds, counting on/back, times tables, equivalence of units of measure and square/prime numbers. Teachers ensure that KIRFs are practised at various points throughout the school day. Parents are also supported in practising KIRFs at home with their children. Regular practice in school and at home (little and often) helps children to recall and retain these facts and therefore supports their fluency.

Mastering Number is a nationwide mathematical programme by the National Centre for Excellence in the Teaching of Mathematics (NCETM) and the Maths Hubs Network. Initially aimed at teachers of pupils in Reception, Year 1 and Year 2, the programme aims to develop solid number sense for children. This includes fluency and flexibility with number facts, which will have a lasting impact on future learning. This programme is being implemented across the Trust in EYFS, Key-stage 1 and in targeted year groups in Key-stage 2. Mastering Number also involves high quality professional development for teachers.

Knowledge Focused

Retrieval practice is the opportunity for all children to recall previous learning, in order to remember it by storing the information in their long-term memory. This previous learning can be linked to the new learning about to take place or a gap that has been identified from assessments. Each child completes the task and is shared amongst peers. Children can observe if they have been successful, if it's something which they need to improve upon and acts as their next step.

New concepts are shared in a variety of ways. One of these ways includes sharing the concept within the context of an initial related problem, which children are able to discuss in partners. This initial problem-solving activity prompts discussion and reasoning, as well as promoting an awareness of maths in relatable real-life contexts that link to other areas of learning. In KS1, these problems are almost always presented with objects (concrete manipulatives) for children to use. Children are also encouraged to use manipulatives in KS2 and are a part of the Quality First Teaching. Teachers use a range of questions to draw out pupil's thoughts and their reasoning. The class teacher then leads children through strategies for solving the problem, including those already discussed. A mathematics lesson includes a series of learning opportunities, each one building on the last to provide children with the confidence to successful complete the independent practice. Independent practice provides the means for all children to develop their fluency further, before progressing to more complex related problems.

Mathematical topics are taught in small blocks, to enable the achievement of 'mastery' over time. The topics are also carefully planned to support the school's thematic approach to ensure the maximum opportunity to retrieve previous learning. Each lesson phase provides the means to achieve greater depth, with more able children being offered rich and sophisticated problems, as well as exploratory, investigative tasks, within the lesson as appropriate.

What we do well as a Trust

Teachers have the flexibility to plan creative, meaningful and contextual lessons. Planning supports the needs of the children and extends those who have the fluency but need reasoning and problem-solving activities to deepen their understanding. The impact of this flexible planning creates independent and resilient learners who thrive on achieving, and being the best, they can be.

Regular and ongoing assessment informs teaching, as well as Point of Need Intervention, to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2 above the national average and a good proportion of children demonstrating greater depth, at the end of each key stage.

Maths National Curriulum & EYFS Framework

National Curriculum Statements:

Purpose of study

Mathematics is a creative and highly interconnected 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.

Aims

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 non-routine problems with increasing sophistication, including breaking down problem s into a series of simpler steps and preserving in seeking solutions

Mathematics in an interconnected subject in which pupils need to be able to move fluently between representations and mathematical ideas. The programmes of study are, by necessity, organized 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 the majority of pupils will move through the programmes of study broadly the same pace. However, decisions about progress should always be based on 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.

Information and Communication Technology (ICT)

Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. In both primary and secondary schools, teachers should use their judgement about when ICT tools should be used.

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.

School Curriculum

The programmes of study for mathematics are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools, therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier stage, if appropriate. All schools are also required to set out their school curriculum for mathematics on a year-by-year basis and make this information available online.

Attainment Targets

By the end of each key stage, pupils are expected to know, apply and understand matters, skills and processes specified in the relevant programme of study.
Schools are not required by law to teach the example content in [square brackets] or the content indicated as being 'non-statutory.'

EYFS

At the end of the foundation stage pupils will;

Mathematics

ELG: Number

Children at the expected level of development will:

- Have a deep understanding of numbers 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.

ELG: 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.

Number: Number and Place Value

Key Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
One Two Three Four Five Six Seven Eight Nine Ten Number zero count on/back lots more few fewer compare sort order before after less many most the same as ones pair	Forwards Backwards Numerals Words Multiples Equal to More than Less than Fewer Most Least Identify Represent Digit Calculate Odd Even Pattern Numbers up to 100	Ones Tens Two-digit Estimate Place value Solve Problems Greater than > Less than < Nearest ten Number facts Partition Count in steps Zero Compare Determine Value	Hundreds Three-digit Ten more One hundred more Ten less One hundred less Roman numeral Numbers up to one thousand	Thousands Four-digit Negative number One thousand more One thousand less Decimal Decimal place Rounding Place holder Nearest ten Nearest hundred Nearest thousand One place Whole number Integer Tenths Hundredths	Ten thousands Hundred thousands Millions Context Steps of powers Decimal Equivalents Two decimal places Thousandths Numbers up to one million	Intervals across zero Three decimal places Hundredths Thousandths Ten thousandths Numbers up to ten million
COUNTING						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Subitise (recognize quantities without counting) up to 5.	Count to and across 100, 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,	Use negative numbers in context, and calculate intervals across zero

					including through zero	
Verbally count beyond 20, recognising the pattern of the counting system.	Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	Count from 0 in multiples of 4, 8, 50 and 100;	Count in multiples of 6, 7, 9, 25 and 1000	Count forwards or backwards in steps of powers of 10 for any given number up to 1, 000, 000	
	Given a number, identify one more and one less		Find 10 or 100 more or less than a given number	Find 1000 more or less than a given number		
	Count within 100, forwards and backwards, starting with any number.		Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10	Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).
COMPARING NUMBERS						
Compare quantities up to 10 in different contexts, recognizing when one quantity is	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 *compare numbers with the same number of decimal places up to two decimal places*	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 (appears

greater than, less than or the same as the other quantity.				(copied from Fractions)	(appears also in Reading and Writing Numbers)	also in Reading and Writing Numbers)
	Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =	Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.	Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.	Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.
IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS						
Explore and represent patterns within numbers up to 10.	Identify and represent numbers using objects and pictorial representations including the number line	Identify, represent and estimate numbers using different representations, including the number line	Identify, represent and estimate numbers using different representations	Identify, represent and estimate numbers using different representations		

READING AND WRITING NUMBERS (including Roman Numerals)						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Write recognisable numbers most of which are correctly formed.	Read and write numbers from 1 to 20 in numerals and words.	Read and write numbers to at least 100 in numerals and in words	Read and write numbers up to 1000 in numerals and in words		Read, write, order and compare numbers to at least 1, 000, 000 and determine the value of each digit (appears also in Comparing Numbers)	Read, write, order and compare numbers up to 10, 000, 000 and determine the value of each digit (appears also in Understanding Place Value)
Link the number symbol (numeral) with its cardinal number value.			*Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks* (copied from Measurement)	Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.	
UNDERSTANDING PLACE VALUE						
Have a deep understanding of number to 10 and beyond, including the composition of each number.		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)
		Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using	Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using	Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using	Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers	Recognise the place value of each digit in numbers up to ten million including decimal fractions.

		standard and non-standard partitioning.	standard and non-standard partitioning.	standard and non-standard partitioning.	with up to 2 decimal places using standard and non-standard partitioning.	Compose and decompose numbers up to ten million using standard and non-standard partitioning.
			Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.	Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.	Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.	Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
					Convert between units of measure, including using common decimals and fractions	

ROUNDING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Round any number to the nearest 10, 100 or 1,000	Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	Round any whole number to a required degree of accuracy
			Round decimals with one decimal place to the nearest whole number (copied from Fractions)	*Round decimals with two decimal places to the nearest whole number and to one decimal place* (copied from Fractions)	*Solve problems which require answers to be rounded to specified degrees of accuracy* (copied from Fractions)
NUMBER FACTS					
Develop fluency in addition and subtraction facts within 10.	Secure fluency in addition and subtraction facts within 10, through continued practice.	Secure fluency in addition and subtraction facts that bridge 10, through continued practice.			
Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.		Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number	Recall multiplication and division facts up to 12 x 12, and recognize products in multiplication tables as multiples of the corresponding number.	Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	
			Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.		
		Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).	Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)	Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).	

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

Number: Addition and Subtraction

Key Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Add More Altogether takeaway number line one more one less equals equal to double half how many? Make total	One step problem Concrete object Pictorial representation Missing number Read Write Interpret Equals = Signs One-digit Two-digit Ones Mental Mentally	Column addition Column subtraction Tens Order Inverse Relationship Calculation Solve problems Missing number problems Quantities Measures Formal written method Mental method Operation Apply Whole number	Three-digit number Hundreds Estimate Number facts	Two-step problems Context Four-digit	Increasingly large numbers More than 4 digits Rounding Determine Context Multi-step problems	Estimation Mixed operations

NUMBER BONDS						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore the composition of numbers to 10	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				
	Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	Add and subtract across 10.	Calculate complements to 100.			Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted

						to multiplication by a whole number).
MENTAL CALCULATION						
Compare quantities up to 10 in different context Automatically recall (sometimes 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.	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
Automatically recall number bonds for numbers 0-5 and some to 10.	Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				Use their knowledge of the order of operations to carry out calculations involving the four operations

WRITTEN METHODS						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs, and relate additive expressions and equations to real-life contexts. (appears also in Mental Calculation)	Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more…?"	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)	Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
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.
		Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.	Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.			Solve problems involving ratio relationships.

PROBLEM SOLVING						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	Solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
		Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)				Solve problems involving addition, subtraction, multiplication and division
		Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.				Solve problems with 2 unknowns.

Number: Multiplication and Division

Key Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Times counting in ones, twos, fives, tens lots of groups of once twice five times sharing share set group left left over double half	Multiples Twos Fives Tens Number Multiply Divide Multiplication Division One step problem Answer Concrete object Pictorial representation Arrays Count Equals Write	Multiplication facts Division facts Multiplication tables Odd numbers Even numbers Share Equally Repeated division Calculate	Missing number problem Estimate Inverse Formal written method Mathematical statement Recall Integer Two-digit One-digit	Derived facts Factors Factor pairs Scaling problems Three-digit	Decimals Four-digit Long multiplication Short division Remainders Context Common factors Common multiples Prime numbers Prime factors Composite number Square number Cube number Notation Squares Cubes	Scale factor Long division Whole number remainders Fractions Rounding Mixed operations

	MULTIPLICATION & DIVISION FACTS					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore and represent patterns within numbers up to 10 and beyond.	*Count in multiples of twos, fives and tens* (copied from Number and Place Value)	*Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value)	*Count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value)	*Count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value)	*Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000* (copied from Number and Place Value)	
Explore double facts and how quantities can be distributed equally.		Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables,	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	Recall multiplication and division facts for multiplication		

		including recognising odd and even numbers		tables up to 12 × 12		
		Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.	Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.	Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.	Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
	MENTAL CALCULATION					
			Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	Multiply and divide numbers mentally drawing upon known facts	Perform mental calculations, including with mixed operations and large numbers
		Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		Recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	*Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) copied from fractions*

	WRITTEN CALCULATION					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
					Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
						use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))

				Understand and apply the distributive property of multiplication.	Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	
	PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				Recognise and use factor pairs and commutativity in mental calculations (repeated)	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Identify common factors, common multiples and prime numbers *Use common factors to simplify fractions; use common multiples to express fractions in the same denomination* (copied from Fractions)
					Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	
					Establish whether a number up to 100 is prime and recall prime numbers up to 19	
					Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	*Calculate, estimate and Compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3* (copied from Measures)

		Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).		Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.	

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

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

Number: Fractions (including Decimals and Percentages)

Key Vocabulary					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fraction Half Equal parts One whole Object Shape Quantity Quarter	Simple fractions Equivalent Count	Tenths Unit fractions Non-unit fractions Numerator Denominator Compare Order Add Subtract Solve problems	Hundredths Decimal Decimal place One decimal place Two decimal places Round decimals Whole number Common equivalent fractions Decimal equivalents Dividing Ones Tenths Hundredths Simple measure Money problems	Thousandths Multiples Three decimal places Percent Number of parts per hundred Percentages Decimal fraction Mixed numbers Improper fractions Proper fraction Convert Mathematical statements Multiply Percentage and decimal equivalents	Common factors Common multiples Decimal fraction equivalents Simplest form
COUNTING IN FRACTIONAL STEPS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Pupils should count in fractions up to 10, starting from any number and using the 1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)	Count up and down in tenths	Count up and down in hundredths		
RECOGNISING FRACTIONS					
Recognise, find and name a half as one of two equal parts of an object, shape or quantity	Recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ 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 hundredths arise when dividing an object by one hundred and dividing tenths by ten	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	

		Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity		Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
COMPARING FRACTIONS					
		Compare and order unit fractions, and fractions with the same denominators		Compare and order fractions whose denominators are all multiples of the same number	Compare and order fractions, including fractions >1
		Find unit fractions of quantities using known division facts (multiplication tables fluency).		Find non-unit fractions of quantities.	Express fractions in a common denomination and use this to compare fractions that are similar in value.
		Reason about the location of any fraction within 1 in the linear number system.	Reason about the location of mixed numbers in the linear number system.		Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.

COMPARING DECIMALS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Compare numbers with the same number of decimal places up to two decimal places	Read, write, order and compare numbers with up to three decimal places	Identify the value of each digit in numbers given to three decimal places
ROUNDING INCLUDING DECIMALS					
			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 (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)					
	Write simple fractions e.g. $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$.	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 = $^{71}/_{100}$) 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. $^{3}/_{8}$)
			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.
			Convert mixed numbers to improper fractions and vice versa.	Find equivalent fractions and understand that they have the same value and the same position in the linear number system.	

<table>
<tr><th colspan="6">ADDITION AND SUBTRACTION OF FRACTIONS</th></tr>
<tr><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td></td><td></td><td>Add and subtract fractions with the same denominator within one whole (e.g. $^{5}/_{7} + {}^{1}/_{7} = {}^{6}/_{7}$)</td><td>Add and subtract fractions with the same denominator</td><td>Add and subtract fractions with the same denominator and multiples of the same number

Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5} = 1{}^{1}/_{5}$)</td><td>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</td></tr>
<tr><td></td><td></td><td>Add and subtract fractions with the same denominator, within 1.</td><td>Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.</td><td>Recall decimal fraction equivalents for ½ , 1/4 , 1/5 and 1/10, and for multiples of these proper fractions</td><td></td></tr>
<tr><th colspan="6">MULTIPLICATION AND DIVISION OF FRACTIONS</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</td><td>Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^{1}/_{4} \times {}^{1}/_{2} = {}^{1}/_{8}$)

Multiply one-digit numbers with up to two decimal places by whole numbers</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Divide proper fractions by whole numbers (e.g. $^{1}/_{3} \div 2 = {}^{1}/_{6}$)</td></tr>
</table>

MULTIPLICATION AND DIVISION OF DECIMALS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					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

PROBLEM SOLVING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Solve problems that involve all of the above	Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	Solve problems involving numbers up to three decimal places	
			Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems which require knowing percentage and decimal equivalents of $^{1}/_{2}$, $^{1}/_{4}$, $^{1}/_{5}$, $^{2}/_{5}$, $^{4}/_{5}$ and those with a denominator of a multiple of 10 or 25.	

Ratio and Proportion

Key Vocabulary					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Ratio Proportion For every…there are… Part Whole Scale factor Enlargement Similar shapes Length Width perimeter
Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division					
					Year 6
					Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
					Solve problems involving the calculation of percentages [for example; of measures, and such as 15% of 360] and the use of percentages for comparison
					Solve problems involving similar shapes where the

					scale factor is known or can be found
					Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Algebra

Key Vocabulary					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Solve One-step problem Missing number Check Calculate problem Sequence Chronological	Inverse Relationship Compare Order Arrange Pattern		Perimeter Algebra Algebraically	Properties Rectangles Deduce Related facts Missing lengths Missing angles	Missing number problem Pairs Number sentence Variables Combination Possibility Enumerate Equation Formulae
EQUATIONS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and ***missing number problems*** *such as* $7 = \square - 9$ (copied from Addition and Subtraction)	*Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and* ***missing number*** *problems.* (copied from Addition and Subtraction)	Solve problems, *including* ***missing number*** *problems, using number facts, place value, and more complex addition and subtraction.* (copied from Addition and Subtraction) *Solve problems, including* ***missing number*** *problems, involving multiplication and division, including integer scaling* (copied from Multiplication and Division)		*Use the properties of rectangles to deduce related facts and find* ***missing lengths and angles*** (copied from Geometry: Properties of Shapes)	Express missing number problems algebraically
	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)				Find pairs of numbers that satisfy number sentences involving two unknowns
Represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)					Enumerate all possibilities of combinations of two variables

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

Measurement

Key Vocabulary									
EYFS		Year 1		Year 2		Year 3	Year 4	Year 5	Year 6
days of the week month year weekend birthday holiday morning afternoon evening night day bedtime dinnertime playtime today yesterday tomorrow before after next, last now fast slow old new clock first last size weight capacity time money	long longer short shorter heavy light empty full tall small large thick thin low ruler holds container weigh coin pound cost money penny (p) buy pay	Length Height Longest Shortest Tall Double Half Mass Heavy Light Heavier than Record Hours Minutes Hour Half past O clock Hands Seconds Coins Notes Dates Weeks Months	Lighter than Volume Full Empty More than Less than Half Half full Quarter Quicker Slower Earlier Later Sequence events Chronological order Before After Next First Evening	Greater than > Less than < Equals = Intervals Standard units Estimate Direction Temperature Unit Scales Rulers Thermometers Measuring vessels Metres Centimetres Kilograms Grams Degrees Celsius	Litres Millilitres Symbols Money Pounds (£) Pence (p) Change Five past Ten past Quarter past Twenty past Twenty-five past Half past Twenty-five to Twenty to Quarter to Ten to Five to	Duration Time taken Nearest minute Record Seconds a.m. p.m. noon midnight kilometre add subtract millimetres perimeter simple 2-D shapes analogue clock roman numerals 12-hour 24-hour Leap year	Estimate Rectilinear Figure Area Rectilinear shapes Convert	Square centimetres (cm2) Square metres (m2) Irregular shapes Volume (cm3) Cubes Cuboids Square numbers Cube numbers Metric units Imperial units Inches Pounds Pints	Decimal notation Cubic centimetres (cm3) Cubic metres (m3) Cubic millimetres (mm3) Miles Formulae

	COMPARING AND ESTIMATING						
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Compare length, weight and capacity.	Compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]	Compare and order lengths, mass, volume/capacity and record the results using >, < and =		Estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)	Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes (also included in measuring)	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.
						Estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water)	
		Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	Compare and sequence intervals of time	Compare durations of events, for example to calculate the time taken by particular events or tasks			

				Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)			
	MEASURING and CALCULATING						
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Measure and compare distance e.g. using cubes to measure how far toys travel.	Measure and begin to record the following: * lengths and heights * mass/weight * capacity and volume * time (hours, minutes, seconds)	Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Estimate, compare and calculate different measures, including money in pounds and pence (appears also in Comparing)	Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Converting)
				Measure the perimeter of simple 2-D shapes	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	Recognise that shapes with the same areas can have different perimeters and vice versa

MEASURING and CALCULATING						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	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*	Calculate the area of parallelograms and triangles
						Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3].

					for squared (^{2}) and cubed (^{3}) (copied from Multiplication and Division)	Recognise when it is possible to use formulae for area and volume of shapes
TELLING THE TIME						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understand some important processes and changes in the natural world around them including the seasons and times day (day and night).	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						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)	Know the number of seconds in a minute and the number of days in each month, year and leap year	Convert between different units of measure (e.g. kilometre to metre; hour to minute)	Convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
				Read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	Solve problems involving converting between units of time	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
				Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	Convert between miles and kilometres

Geometry: Properties of Shapes

Key Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Flat Round Sides Corners Straight Curved Shape Group Sort Make Build Draw Square Rectangle Circle Triangle	2-D shapes 3-D shapes Two-dimensional Three-dimensional Cuboid Cube Pyramid Cone Cylinder Sphere	Properties Compare Common Line symmetry Vertical line Edges Faces Vertices Pentagon Hexagon Octagon Nonagon Decagon Kite Rhombus Polygon Square-based pyramid Triangular pyramid Triangular prism Rectangular prism Pentagonal prism Hexagonal prism Octagonal prism	Angle Turn Right angles Quarter of a turn Half-turn Three quarters of a turn Complete turn Horizontal lines Vertical lines Perpendicular lines Parallel lines	Lines of symmetry Symmetrical figure Classify Geometric shapes Quadrilaterals Acute angle Obtuse angle	Angles Measure Degrees Missing lengths Missing angles Regular polygons Irregular polygons Degrees Estimate Compare Reflex angle Point Straight line Multiples	Radius Diameter Circumference Nets
	IDENTIFYING SHAPES AND THIER PROPERTIES					
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Compose and decompose shapes so that children recognize a shape can have other shapes within it, just as numbers can.	Recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares),	Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line		Identify lines of symmetry in 2-D shapes presented in different orientations	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)

	circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	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
Recognise and name simple 2D shapes (square, triangle, circle, rectangle).		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 (°)	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)
	Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.		Draw polygons by joining marked points, and identify parallel and perpendicular sides.	Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.		Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

				Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.		
	COMPARING AND CLASSIFYING					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		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	
					Compare areas and calculate the area of rectangles (including squares) using standard units.	

				Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.		
	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			
	Recognise common 2D and 3D shapes presented in different orientations, and	Use precise language to describe the properties of 2D and 3D shapes, and	Recognise right angles as a property of shape or a description of a turn, and identify right		Compare angles, estimate and measure angles in degrees (°)	

	know that rectangles, triangles, cuboids and pyramids are not always similar to one another.	compare shapes by reasoning about similarities and differences in properties.	angles in 2D shapes presented in different orientations.		and draw angles of a given size.	

Geometry: Position and Direction

Key Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
position, distance, after, before, in, on, inside, under, on top of, behind, next to, above, below, top, bottom, side, outside, around, underneath, in front, front, back, before, middle, up, down, forwards, backwards, across, close, far, along, to, from, slide, roll, turn, stretch, bend, move	Half turn Quarter turn Three-quarter turn Left Right Up Down	Rotation Right angle Clockwise Anti-clockwise Order Arrange Sequence		Co-ordinates Quadrant Grid Translate Translation Axis x-axis y-axis	Reflection	Four quadrants
POSITION, DIRECTION AND MOVEMENT						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Select, rotate and manipulate shapes in order to develop spatial reasoning skills.	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		
	PATTERN					
Continue, copy and create repeating patterns.		Order and arrange combinations of mathematical objects in patterns and sequences				

Statistics

Key Vocabulary					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Interpret Construct Pictogram Tally chart Block diagrams Horizontal Vertical x-axis y-axis key chart title table ask answer questions counting objects category sort quantity total compare data	Present Presented Graph Statistics Bar charts Tables Solve One-step questions Two-step questions Information	Time graphs Comparison Problems	Timetables Line graph	Pie chart Calculate Mean Average

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

IMPACT SUMMARY						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Children in Reception will have a deep understanding of number to 10, including the composition of each number; 14. They will know and understanding how to Subitise (recognise quantities without counting) up to 5. They will be able to 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. Children will be able to verbally count beyond 20, recognising the pattern of the counting system. They can compare quantities up to 10 in different contexts,	Children in Year 1 should be able to count to thirty and identify number bonds to ten and twenty. They should be able to add and subtract two groups and write number sentences to show this. They should be able to use resources to show their reasoning. Children should be able to identify a range of simple 2D and 3D shapes and recall basic properties (e.g. corners, faces). They can divide objects into groups and draw simple arrays. They can identify coins and measure simple lengths, heights, capacities and volumes.	Children in Year 2 will be able to count to 100 and beyond, They will use place value to add and subtract a 2-digit and a 2-digit number beginning to show exchange and carrying. They know their 2, 5 and 10 times table They can name and describe common 2d and 3d shapes. They can show mastery in the way that they use their written methods and understand word problems. They will be confident using bar models and part part whole models. They understand the fractions halves quarters and thirds. They recognize and use coins. They can tell the time to the nearest 15 minutes.	Children in Year 3 have a secure understanding of place value to 3 digit numbers, are able to use the column method confidently to add and subtract 3 numbers. They will have a secure knowledge of the 3,4 and 8 times tables and will be able to use written methods for multiplication and division.	Children in Year 4 have a growing confidence with place value, using these skills within both written and mental calculations for all four operations. Children have developed a better understanding of mathematical reasoning.	Children in Year 5 are prepared for KS2 SATS through their knowledge of mathematical concepts and their ability to explain and reason their mathematical thinking using a wide range of vocabulary.	Children in Year 6 are prepared for transition to KS3 through their knowledge of mathematical concepts and their ability to explain and reason their mathematical thinking using a wide range of vocabulary.

recognising when one quantity is greater than, less than or the same as the other quantity. Children will also be able to explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally						