Mathematics - Number

Progression of Knowledge and Skills

EYFS-Year 6

EYFS

Reception

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

Informed by new Development Matters (2020) publication

	Mathematics
Year Reception	• Count objects, actions and sounds. • Subitise. • Link the number symbol (numeral) with its cardinal number value. • Count beyond ten. • Compare numbers. • Understand the 'one more than/one less than' relationship between consecutive numbers. • Explore the composition of numbers to 10. • Automatically recall number bonds for numbers 0–10.
ELG	• 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. • 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

Year 1

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

	Place Value *Counting*	Place Value *Representing*	Place Value *Using and Comparing*	Place Value *Problems and Rounding*	Addition and Subtraction *Recall, Represent and Use*	Addition and Subtraction *Calculations*	Addition and Subtraction *Problem Solving*	Multiplication and Division *Recall, Represent and Use*	Multiplication and Division *Calculations*	Multiplication and Division *Problem Solving*	Fractions *Recognise and Write*	Fractions *Compare*	Fractions *Calculations*	Fractions *Problem Solving*	Algebra
Year 1	count to and across 100, forwards and backwards, beginnir with 0 or 1, or from any given number Count numbers to 100 in numerals; count in multiples o twos, fives and tens **Autumn 1 Autumn 4 Spring 2 Summer 4**	identify and represent numbers using objects and pictorial representations read and write numbers to 100 in numerals read and write numbers from 1 to 20 in numerals and words. **Autumn 1 Autumn 4 Spring 2 Summer 4**	given a number, identify one more and one less **Autumn 1 Autumn 4 Spring 2 Summer 4**		read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs represent and use number bonds and related subtraction facts within 20 **Autumn 2 Spring 1**	add and subtract one-digit and two-digit numbers to 20, including zero **Autumn 2 Spring 1**	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9 **Autumn 2 Spring 1**			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 **Summer 1**	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				solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9 Note – although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3

Key Stage 1

Year 2

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

	Place Value *Counting*	Place Value *Representing*	Place Value *Using and Comparing*	Place Value *Problems and Rounding*	Addition and Subtraction *Recall, Represent and Use*	Addition and Subtraction *Calculations*	Addition and Subtraction *Problem Solving*	Multiplication and Division *Recall, Represent and Use*	Multiplication and Division *Calculations*	Multiplication and Division *Problem Solving*	Fractions *Recognise and Write*	Fractions *Compare*	Fractions *Calculations*	Fractions *Problem Solving*	Algebra
Year 2	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward **Autumn 1**	read and write numbers to at least 100 in numerals and in words identify, represent and estimate numbers using different representations, including the number line **Autumn 1**	recognise the place value of each digit in a two-digit number (tens, ones) compare and order numbers from 0 up to 100; use <, > and = signs **Autumn 1**	use place value and number facts to solve problems. **Autumn 1**	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems **Autumn 2**	• 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 **Autumn 2**	• 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 **Autumn 2** **Autumn 4** **Spring 1**	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot **Autumn 4** **Spring 1**	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs **Autumn 4** **Spring 1**	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts **Autumn 4** **Spring 1**	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity **Spring 4**	Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ **Spring 4**	write simple fractions for example, $\frac{1}{2}$ of 6 = 3 **Spring 4**		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems Note – although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3

Key Stage 2

Year 3

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

	Place Value *Counting*	Place Value *Representing*	Place Value *Using and Comparing*	Place Value *Problems and Rounding*	Addition and Subtraction *Recall, Represent and Use*	Addition and Subtraction *Calculations*	Addition and Subtraction *Problem Solving*	Multiplication and Division *Recall, Represent and Use*	Multiplication and Division *Calculations*	Multiplication and Division *Problem Solving*	Fractions *Recognise and Write*	Fractions *Compare*	Fractions *Calculations*	Fractions *Problem Solving*	Algebra
Year 3	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number **Autumn 1 Autumn 3**	identify, represent and estimate numbers using different representations read and write numbers up to 100 in numerals and in words **Autumn 1**	• recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 **Autumn 1**	solve number problems and practical problems involving these ideas **Autumn 1**	estimate the answer to a calculation and use inverse operations to check answers **Autumn 2**	• 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 with up to three digits, using formal written methods of columnar addition and subtraction **Autumn 2**	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction **Autumn 2**	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables **Autumn 3**	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 **Autumn 3 Spring 1**	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 **Spring 1**	• count up and down in tenths; 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 write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators **Spring 5**	• recognise and show, using diagrams, equivalent fractions with small denominators • compare and order unit fractions, and fractions with the same denominators **Summer 1**	add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$] **Summer 1**	solve problems that involve all of the above **Spring 5 Summer 1**	solve problems, including missing number problems Note – although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3

Key Stage 2

Year 4

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

	Place Value *Counting*	Place Value *Representing*	Place Value *Using and Comparing*	Place Value *Problems and Rounding*	Addition and Subtraction *Recall, Represent and Use*	Addition and Subtraction *Calculations*	Addition and Subtraction *Problem Solving*	Multiplication and Division *Recall, Represent and Use*	Multiplication and Division *Calculations*	Multiplication and Division *Problem Solving*	Fractions *Recognise and Write*	Fractions *Compare*	Fractions *Calculations*	Fractions *Problem Solving*	Algebra
Year 4	count in multiples o 6, 7, 9, 25 and 1000 count backwards through zero to include negative numbers **Autumn 1 Autumn 4**	identify, represent and estimate numbers using different representations read Roman numerals to 100 (I t C) and know that ov time, the numeral system changed to include the concept zero and place value **Autumn 1**	find 1000 more or less than a given number recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000 **Autumn 1**	round any number to the nearest 10, 100 or 1000 solve number and practical problems that involve all of the above and with increasingly large positive numbers **Autumn 1**	estimate and use inverse operations to check answers to a calculation **Autumn 2**	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate **Autumn 2**	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why **Autumn 2**	recall multiplication and division facts for multiplication tables up to 12 × 12 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 recognise and use factor pairs and commutativity in mental calculations **Autumn 4 Spring 1**	multiply two-digit and three-digit numbers by a one-digit number using formal written layout **Spring 1**	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 **Spring 1**	count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. **Spring 3**	recognise and show, using diagrams, families of common equivalent fractions **Spring 3**	add and subtract fractions with the same denominator **Spring 3**	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 **Spring 3**	Note – although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3

	Decimals *Recognise and Write*	Decimals *Compare*	Decimals *Calculations and Problems*	Fractions, Decimals and Percentages
	recognise and write decimal equivalents of any number of tenths or hundredth recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ **Spring 4 Summer 1**	round decimals with one decimal place t the nearest whole number compare numbers with the same number of decimal places up to two decimal places **Summer 1**	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 **Spring 4**	solve simple measure and money problems involving fractions and decimals to two decimal places **Spring 3 Spring 4 Summer 1**

Key Stage 2

Year 5

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

	Place Value *Counting*	Place Value *Representing*	Place Value *Using and Comparing*	Place Value *Problems and Rounding*	Addition and Subtraction *Recall, Represent and Use*	Addition and Subtraction *Calculations*	Addition and Subtraction *Problem Solving*	Multiplication and Division *Recall, Represent and Use*	Multiplication and Division *Calculations*	Multiplication and Division *Problem Solving*	Fractions *Recognise and Write*	Fractions *Compare*	Fractions *Calculations*	Fractions *Problem Solving*	Algebra
Year 5	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 count forwards and backwards with positive and negative whole numbers, including through zero **Autumn 1**	read, write, (order and compare) numbers to at least 1 000 000 and determine the value of each digit read Roman numerals to 1000 (M) and recognise years written in Roman numerals. **Autumn 1**	(read, write) order and compare numbers to at least 1 000 000 and determine the value of each digit **Autumn 1**	interpret negative numbers in context round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 solve number problems and practical problems that involve all of the above **Autumn 1**	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy **Autumn 2**	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) add and subtract numbers mentally with increasingly large numbers **Autumn 2**	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 and a combination of these, including understanding the meaning of the equals sign **Autumn 2**	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers 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}) **Autumn 4**	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 and divide numbers mentally drawing upon known facts 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 multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 **Autumn 4 Spring 1 Summer 1**	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates **Autumn 4 Spring 1** solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$] **Spring 2**	compare and order fractions whose denominators are all multiples of the same number **Spring 2**	add and subtract fractions with the same denominator and denominators that are multiples of the same number multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams **Spring 3**		Note – although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3
	Decimals *Recognise and Write*	**Decimals *Compare***	**Decimals *Calculations and Problems***	**Fractions, Decimals and Percentages**		**Ratio and Proportion**									
	read and write decimal numbers as fractions [for example, $0.71=\frac{71}{100}$] recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents **Spring 3**	round decimals with two decimal places to the nearest whole number and to one decimal place read, write, order and compare numbers with up to three decimal places **Spring 3**	solve problems involving number up to three decimal places **Summer 1**	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, and as a decimal solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 **Spring 3**										

Key Stage 2

Year 6

For more information about the units covered throughout the year, refer to the White Rose Maths long-term plan/overview and medium-term plans/schemes of learning

	Place Value *Counting*	Place Value *Representing*	Place Value *Using and Comparing*	Place Value *Problems and Rounding*	Addition and Subtraction *Recall, Represent and Use*	Addition and Subtraction *Calculations*	Addition and Subtraction *Problem Solving*	Multiplication and Division *Recall, Represent and Use*	Multiplication and Division *Calculations*	Multiplication and Division *Problem Solving*	Fractions *Recognise and Write*	Fractions *Compare*	Fractions *Calculations*	Fractions *Problem Solving*	Algebra
Year 6		read, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit **Autumn 1**	(read, write), order and compare numbers up to 10 000 000 and determine the value of each digit **Autumn 1**	round any whole number to a required degree of accuracy use negative numbers in context, and calculate intervals across zero solve number and practical problems that involve all of the above **Autumn 1**	perform mental calculations, including with mixed operations and large numbers use their knowledge of the order of operations to carry out calculations involving the four operations **Autumn 2**		solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **Autumn 2**	identify common factors, common multiples and prime numbers use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. **Autumn 2**	• multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • divide numbers up to 4 digits by a 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 • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • perform mental calculations, including with mixed operations and large numbers **Autumn 2**	solve problems involving addition, subtraction, multiplication and division **Autumn 2** use their knowledge of the order of operations to carry out calculations involving the four operations		use common factors to simplify fractions; use common multiples to express fractions in the same denomination compare and order fractions, including fractions > 1 **Autumn 3**	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] **Autumn 3**		• use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables. **Spring 3**

	Decimals *Recognise and Write*	Decimals *Compare*	Decimals *Calculations and Problems*	Fractions, Decimals and Percentages	Ratio and Proportion							
	identify the value of each digit in numbers given to three decimal places **Spring 1**		• multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • multiply one-digit numbers with up to two decimal places by whole numbers • use written division methods in cases where the answer has up to two decimal places • solve problems which require answers to be rounded to specified degrees of accuracy **Spring 1**	• associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts **Spring 1** **Spring 2**	• 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. **Spring 6**						