

KS1-KS2 Maths Objective Overview (2022-23)



Overarching Aims:

The aim of this curriculum is 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 problems into a series of simpler steps and persevering in seeking solutions

Age-related expectations:

The expectation is that the majority of pupils will be working on age related objectives. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

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. Teachers should use their judgement about when ICT tools should be used.

Spoken language:

Our curriculum 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.

Cross-curricular:

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. 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.

KS1-KS2 Maths Objective Overview (2022-23)



Term	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1	<ul style="list-style-type: none"> • Number: Place Values (within 10) • Number: Addition and Subtraction (within 10) • Geometry (Shape) 	<ul style="list-style-type: none"> • Number: Place Values • Number: Addition and Subtractions • Geometry: Properties of Shape 	<ul style="list-style-type: none"> • Number: Place Values • Number: Addition and Subtractions • Number: Multiplication and Division 	<ul style="list-style-type: none"> • Number: Place Value • Number: Addition and Subtraction • Measurement: Area • Number: Multiplication and Division 	<ul style="list-style-type: none"> • Number: Place Values • Number: Addition and Subtraction • Multiplication and Division • Fractions 	<ul style="list-style-type: none"> • Number: Place Values • Number: Addition, Subtraction, Multiplication and Division • Number: Fractions • Measure: Converting Units
2	<ul style="list-style-type: none"> • Number: Place Values (within 20) • Number: Addition and Subtraction (within 20) • Number: Place values (within 50) (multiples of 2,5 and 10 included) • Measurement - Length and height • Measurement: Mass and Volume 	<ul style="list-style-type: none"> • Number: Multiplication and Division • Money • Multiplication and Division • Length and Height • Mass, Capacity and Temperature 	<ul style="list-style-type: none"> • Number: Multiplication and Division • Measurement: Length and Perimeter • Number: Fractions • Mass and Capacity 	<ul style="list-style-type: none"> • Number: Multiplication and Division • Measurement: Length and Perimeter • Number: Fractions • Number: Decimals 	<ul style="list-style-type: none"> • Number: Multiplication and Division • Number: Fractions • Number: Decimals • Measurement: Area and Perimeter • Statistics 	<ul style="list-style-type: none"> • Number: Ratio • Number: Algebra • Number: Decimals • Fractions, decimals and percentages • Measurement: Perimeter, Area and Volume • Statistics
3	<ul style="list-style-type: none"> • Number: Multiplication and divisions (Reinforce multiples of 2,5 and 10 to be included) • Number: fractions • Geometry: Position and direction • Number: Place values (within 100) • Measurement: Money • Time 	<ul style="list-style-type: none"> • Fractions • Measurement: Time • Statistics, • Geometry - position and direction, • Problem solving 	<ul style="list-style-type: none"> • Number: Fractions • Money • Measurement: Time • Geometry: Properties of Shape • Statistics 	<ul style="list-style-type: none"> • Number: Decimals • Measurement: Money • Measurement: Time • Statistics • Geometry: Properties of Shape • Geometry: Position and Direction 	<ul style="list-style-type: none"> • Geometry: Properties of Shapes • Geometry: Position and Direction • Number: decimals • Number: Negative numbers • Converting units • Measurement: Volume 	<ul style="list-style-type: none"> • Geometry: Properties of Shapes • Problem Solving • Investigations

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value Counting		<ul style="list-style-type: none"> count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s 	<ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward 	<ul style="list-style-type: none"> count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number 	<ul style="list-style-type: none"> count in multiples of 6, 7, 9, 25 and 1,000 count backwards through 0 to include negative numbers (100s, 10s, and 1s) representations and with increasingly large positive numbers 	<ul style="list-style-type: none"> count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0 	
Place Value Represent		<ul style="list-style-type: none"> identify and represent numbers using objects and pictorial representations including the number line, and use the language of: <ul style="list-style-type: none"> equal to, more than, less than (fewer), most, least read and write numbers from 1 to 20 in numerals and words 	<ul style="list-style-type: none"> identify, represent and estimate numbers using different representations read and write numbers to at least 100 in numerals and in words representations, including the number line 	<ul style="list-style-type: none"> identify, represent and estimate numbers using different representations read and write numbers up to 1,000 in numerals and in words 	<ul style="list-style-type: none"> identify, represent and estimate numbers using different representations read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value 	<ul style="list-style-type: none"> read Roman numerals to 1,000 (M) and recognise years written in Roman numerals 	<ul style="list-style-type: none"> read, write, order and compare numbers up to 10,000,000 and determine the value of each digit



KS1-KS2 Maths Objective Overview (2022-23)

Place Values: Use PV and Compare	<ul style="list-style-type: none"> given a number, identify 1 more and 1 less 	<ul style="list-style-type: none"> recognise the place value of each digit in a two-digit number (10s, 1s) compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs 	<ul style="list-style-type: none"> recognise the place value of each digit in a 3-digit number (100s, 10s, 1s) compare and order numbers up to 1,000 solve number problems and practical problems involving these ideas 	<ul style="list-style-type: none"> find 1,000 more or less than a given number recognise the place value of each digit in a four-digit number (1,000s, order and compare numbers beyond 1,000 	<ul style="list-style-type: none"> read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit 	<ul style="list-style-type: none"> read, write, order and compare numbers up to 10,000,000 and determine the value of each digit
Place Value: Problems and Rounding	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> use place value and number facts to solve problems 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Interpret negative numbers in context round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 solve number problems and practical problems that involve all of the above 	<ul style="list-style-type: none"> Round any whole number to the required degree of accuracy in context and calculate intervals across zero Solve number and practical problems that involve the above.

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition and Subtraction: Recall, Represent, Use		<ul style="list-style-type: none"> Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs Represent and use number bonds and related subtraction facts within 20 	<ul style="list-style-type: none"> Recall and use addition and subtraction fact 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 	<ul style="list-style-type: none"> Estimate the answer to a calculation and use inverse operation to check answers 	<ul style="list-style-type: none"> Estimate and use inverse operations to check answers to a calculation 	<ul style="list-style-type: none"> Use rounding to check answer to calculations and determine, in the context of a problem, levels of accuracy 	
Addition and Subtraction: Calculations		<ul style="list-style-type: none"> Add and subtract one- and two-digit number to 20 including zero 	<ul style="list-style-type: none"> Add and subtract numbers using concrete objects, pictorial representation, and mentally including <ul style="list-style-type: none"> A two digit number and ones A two digit number and tens Two two digit numbers Adding three one digit numbers 	<ul style="list-style-type: none"> Add and subtract numbers mentally including <ul style="list-style-type: none"> A three-digit number and ones A three-digit number and tens A three-digit number and hundreds Add and subtract number with up to three digits, using formal written methods of columnar addition and subtraction 	<ul style="list-style-type: none"> Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate 	<ul style="list-style-type: none"> Add and subtract whole numbers with more than 4 digits using written methods (columnar addition and subtraction) Add and subtract number mentally with increasingly large numbers 	<ul style="list-style-type: none"> Perform mental calculations, including with mixed operation and large number Use their knowledge of the order of operation to carry out calculation involving the four operations



KS1-KS2 Maths Objective Overview (2022-23)

Addition and Subtraction: Solve Problems		<ul style="list-style-type: none">Solve problems than involve addition and subtraction, using concrete objects and pictorial representation, and missing number problem such as $7 - ? = 9$	<ul style="list-style-type: none">Solve problems with addition and subtraction using concrete objects and pictorial representation, including those involving number, quantities and measureApplying their increasing knowledge of mental and written methods	<ul style="list-style-type: none">Solve problems including missing number problems using number facts, place values, and more complex addition and subtraction	<ul style="list-style-type: none">Solve addition and subtraction two step problems in contexts, deciding which operation and method to use and why	<ul style="list-style-type: none">Subtraction multi-step problems in context deciding which operation and methods to use and whySolve problems involving addition, subtraction, multiplication and division and a combination of these including understanding the meaning of the equals sign	<ul style="list-style-type: none">Solve addition and subtraction multi-step problems in contexts decode which operations and methods to use and why
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KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division: Recall, Represent, Use			<ul style="list-style-type: none"> Recall and use multiplication and division fact for the 2,5 and 10 multiplication tables, including recognizing odd and even number. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot 	<ul style="list-style-type: none"> Recall and use multiplication and division fact for the 3,4 and 8 multiplication tables 	<ul style="list-style-type: none"> Recall multiplication and division fact for multiplication tables up to 12 x 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 	<ul style="list-style-type: none"> Identify and recall 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 (nonprime) 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) 	<ul style="list-style-type: none"> Identify common factors, common multiplies and prime numbers Use estimation to check answers to calculation and determine, in the context of a problem, an appropriate degree of accuracy.

KS1-KS2 Maths Objective Overview (2022-23)



Multiplications and Division: Calculations		<ul style="list-style-type: none"> Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) signs 	<ul style="list-style-type: none"> Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know including for two-digit number times one-digit numbers, using mental and progressing to formal written methods 	<ul style="list-style-type: none"> Multiply two-digit and three-digit numbers by a one-digit number using formal written layout 	<ul style="list-style-type: none"> 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 number 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 number and those involving decimals by 10, 100 and 1000 	<ul style="list-style-type: none"> 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 numbers, remainders as fractions, or by rounding, as appropriate for context Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainder according to the context
Multiplication and Division: Solve Problems	<ul style="list-style-type: none"> Problem solving multiplication and division, by calculating the answer using concrete objects, pictorial representation and arrays with the support of the teacher 	<ul style="list-style-type: none"> Solve problem involving multiplication and division, using material, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problem and harder correspondence problems such as n objects are connected to m objects 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Solve problems involving addition, subtraction, multiplication and division

KS1-KS2 Maths Objective Overview (2022-23)



Multiplication and Division: Combined Operations					<ul style="list-style-type: none">• Solve problems involving addition, subtractions, multiplications and division and a combination of these, including understanding the meaning of the equals sign	<ul style="list-style-type: none">• Use their knowledge of the order of operation to carry out calculation involving the four operations	
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KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions: Recognise and Write		<ul style="list-style-type: none"> Recognises, find and name a half as one of two equal parts of an objects, shapes or quantity Recognise find and name a quarte as a one of four equal parts of an object, shape of quantity 	<ul style="list-style-type: none"> Recognises, fins, names and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}$ of a length, shape, set of objects or quantity 	<ul style="list-style-type: none"> Count up and down in tenths, recognise that tenths arise from dividing an object into 10-equal parts and in dividing one-digit number or quantities by 10 Recognise, find and write fractions of a discrete set of objects, unit fraction and non-unit fractions with small denominators Recognise and use fractions as number: unit fractions and non-unit fractions with small denominators 	<ul style="list-style-type: none"> Count up and own in hundredths, recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. 	<ul style="list-style-type: none"> Identify, name and write equivalent fractions a given fraction, represented visually, including tenths and hundredth Recognise mixed number and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (for examples, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5}$ or $1\frac{1}{5}$) 	
Fractions: Compare			<ul style="list-style-type: none"> Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ 		<ul style="list-style-type: none"> Recognise and show diagrams, families of common equivalent fractions 	<ul style="list-style-type: none"> Compare and order fractions whose denominators are all multiples of the same number 	<ul style="list-style-type: none"> Use common factors to simplify fractions; use common multiples to express fractions ion the same denominations Compare and order fractions, including fractions > 1

KS1-KS2 Maths Objective Overview (2022-23)



Fractions: Solve Problems			<ul style="list-style-type: none"> Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 	<ul style="list-style-type: none"> Add and subtract fraction with the same denominator within one whole for examples $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ 	<ul style="list-style-type: none"> Add and subtract fractions with the same denominator 	<ul style="list-style-type: none"> Add and subtract fractions with the same denominator and denominators that are multiples of the same numbers Multiply proper fractions and mixed numbers by whole numbers, supported by material and diagrams 	<ul style="list-style-type: none"> Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions Multiply simple pairs of proper fractions writing the answers in its simplest form for examples $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ Divide proper fractions by whole number for examples $\frac{1}{3} \div 2 = \frac{1}{6}$
			<ul style="list-style-type: none"> Solve problems that involve all of the above 	<ul style="list-style-type: none"> 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 			
Fractions: Calculations							

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Decimals: Recognise and write					<ul style="list-style-type: none"> Recognises and write decimal equivalent of any number of tenths or hundredths Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ 	<ul style="list-style-type: none"> Read and write decimal number for fractions (for example, $0.71 = \frac{71}{100}$) Recognize sand use thousands and relate them to tenths hundredths and decimal equivalents 	<ul style="list-style-type: none"> Identify the value of each digit in numbers given to three decimal places
Decimals: Compare					<ul style="list-style-type: none"> Round decimals with one decimal place to the nearest whole number Compare numbers with the same number of decimal places up to two decimal places 	<ul style="list-style-type: none"> Reound 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 	
Decimals: Calculations and Problems					<ul style="list-style-type: none"> Find the effect of dividing a one- or two-digit number by 10 and 100. Identifying the values of the digits in the answers as one's tenths and hundredths 	<ul style="list-style-type: none"> Solve problems involving numbers up to three decimal places 	<ul style="list-style-type: none"> Multiply and divide number by 10,100 and 1000 giving answers up to three decimal places Numbers with up to two decimal places by whole numbers Use written division method in cases where the answer has up to two decimal places Solve problem which require answers to be rounded to specified degrees of accuracy

KS1-KS2 Maths Objective Overview (2022-23)



Fractions, Decimals and Percentages				<ul style="list-style-type: none"> Solve simple measure and money problems involving fractions and decimals to two decimal places 	<ul style="list-style-type: none"> Recognise the per cent symbol (%) and understand that percent elates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal Solve problems which require knowing percentages 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 	<ul style="list-style-type: none"> Associate a fraction with division and calculate decimal fraction equivalents (For example, 0.375 for a simple fraction, $\frac{3}{8}$) Recall and use equivalence between simple fraction, decimals and percentage, including in different context.

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio and Proportion							<ul style="list-style-type: none"> Solve problems involving the relative sizes of two quantities where missing values can be found by using integers multiplication and division facts. Solved 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 shares where the scale factor is known or can be found Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algebra		<ul style="list-style-type: none"> Problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$ 	<ul style="list-style-type: none"> Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems 	<ul style="list-style-type: none"> Solve problems including missing number problems 			<ul style="list-style-type: none"> Use simple formulae Linear number sequences Express missing number [problem algebraically Find pairs of numbers that satisfy an equation with two unknowns Enumerate possibilities of combination of two variables

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Using Measure		<ul style="list-style-type: none"> Compare, describe and solve practical problems for Length and height (for examples long/short, longer/shorter, tall/short, double/half) Mass/weight (for examples, heavy/light, heavier than, lighter than) Capacity and volume (for example full/empty, more than, less than, half, half full, quarter) Time (for example, quicker, slower, earlier, later) Measure and begin to record the following Length and heights Mass/Weight Capacity and Volume Time (hours, minutes and seconds) 	<ul style="list-style-type: none"> 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 rules, scales, thermometer and measuring vessels Compare and order lengths, mass, volume/capacity and record the results using >, < and = 	<ul style="list-style-type: none"> Measure, compare, add and subtract lengths (m/cm/mm); mass (kg/g); volume/ capacity (l/ml) 	<ul style="list-style-type: none"> Different units of measure (for example, kilometres to metre, hour to minute) Estimate, compare and calculate different measures 	<ul style="list-style-type: none"> Different units of metric measure (for example, kilometres and metre, centimeter and metre, centimetre and millimetre, gram and kilogram, litre and millilitre) Understand and use approximate equivalence between metric units and common imperial units such as inches, pounder and pints Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling 	<ul style="list-style-type: none"> Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate Use, read, write and convert between standard units, converting measurement 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, Convert between miles and kilometers



KS1-KS2 Maths Objective Overview (2022-23)

Measurement: Money		<ul style="list-style-type: none"> Recognise and know the value of different denomination of coins and notes 	<ul style="list-style-type: none"> Recognise and use symbols of pounds (£) and pence (p); combine amounts to make a particular value Find different combinations of coins that equal the same amount of money Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change 	<ul style="list-style-type: none"> Add and subtract amounts of money to give changes, using both £ and p in practical contexts 	<ul style="list-style-type: none"> Estimate and compare and calculate different measures, including money in pounds and pence 	<ul style="list-style-type: none"> Use all four operations to solve problems involving measure (for example, money) 	
Measurement: Time		<ul style="list-style-type: none"> Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening) Recognise and use language relating to dates, including days of the week, weeks, months and years Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times 	<ul style="list-style-type: none"> Compare and sequence intervals of 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 Know the number of minutes in an hour and the number of hours in a day 	<ul style="list-style-type: none"> Tell and write the time from an analogue clock, including using Roman numeral from I to XII, and 12-hour and 24-hour clocks Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minute and hours, use vocabulary such as O'clock, am/pm, morning, afternoon, noon and midnight Know the number of seconds in a minute and the number of days in each month, year and leap year Compare duration of events (for example to calculate the time taken by particular events of tasks) 	<ul style="list-style-type: none"> Convert time between analogue and digital 12- and 24-hour clocks Solve problems involving converting from hours to minutes, minutes to seconds; years to months; week to days 		<ul style="list-style-type: none"> Convert between standard units converting measurements of time from a smaller unit of measure to a larger unit, and vice versa



KS1-KS2 Maths Objective Overview (2022-23)

Measurement: Perimeter, Area, Volume			<ul style="list-style-type: none">• Measure the perimeter of a simple 2-D shape	<ul style="list-style-type: none">• Measure and calculate the perimeter of a rectilinear figure (including squares) in centimeters and meters• Find the area of rectilinear shapes by counting squares	<ul style="list-style-type: none">• Measure and calculate the perimeter of composite rectilinear shapes in centimeters and meters• Calculate and compare the area of rectangles (including squares), and including using standard units, square centimeter (cm^2) a square meter (m^2) and estimate the area of irregular shapes• Estimate volume for examples, using 1cm^3 blocks to build cuboids (including cubes) and capacity (for example, using water)	<ul style="list-style-type: none">• Recognise that shapes with the same areas can have different perimeters and vice versa• Recognise when it is possible to use formulae for area and volume of shapes• Calculate the area of parallelograms and triangles• Calculate, estimate and compare volume of cubes and cuboids using standard units including cubic centimeters (cm^3) and cubic meters (m^3), and extending to other units (for example, mm^3 and km^3)

KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry: 2-D shapes		<ul style="list-style-type: none"> Recognise and name common 2-D shapes (for examples rectangles (including squares), circles and triangles) 	<ul style="list-style-type: none"> Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line Identify 2D shapes on the surface of 3D shapes (for example a circle on a cylinder and a triangle on a pyramid) Compare and sort common 2-D shapes and everyday objects 		<ul style="list-style-type: none"> Compare and classify geometric shapes, including quadrilaterals and triangles bases on their properties and sizes, Identify lines of symmetry in 2_D shapes presents in different orientations 	<ul style="list-style-type: none"> Distinguish between regular and irregular polygons-based n reasoning about equal sides and angles Use the properties of rectangles to deduce related facts and find missing lengths and angles 	<ul style="list-style-type: none"> Draw “-D shapes using given dimension and angles Compare and classify geometric shapes based on their properties and sizes Illustrate and make parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Geometry 3-D Shapes		<ul style="list-style-type: none"> Recognise and name common 3-D shapes (for example cuboids, cubes, pyramid and spheres) 	<ul style="list-style-type: none"> Recognise and name common 3-D shapes (for example, cuboids, cubes, pyramids and spheres) Compare and sort common 3-D Shapes and everyday objects 	<ul style="list-style-type: none"> Make 3-D shapes using modeling material; recognise 3-D shapes in different orientation and describe them 		<ul style="list-style-type: none"> Identify 3-D shapes including cubes and other cuboids, from 2-D representations 	<ul style="list-style-type: none"> Recongise, describe and build simple 3-D shapes, including making nets
Geometry: Angles and Lines				<ul style="list-style-type: none"> Recognise angles as a property of shapes or a description of a turn Identify right angles, recognise that two right and angles makes a half turn, three make a three-quarter turn and four a complete turn; identify whether angles are greater than or less than a right angle Identify horizontal and vertical lines and pairs of perpendicular and parallel line 	<ul style="list-style-type: none"> Identify acute an obtuse angle and compare and order angles up to two right angles by size Identify lines of symmetry in 2-D shapes presented in different orientation Complete a simple symmetric figure with respect to a specific line of symmetry 	<ul style="list-style-type: none"> Know angles are measured in degrees; estimate and compare acute a, obtuse and reflex angles Draw given angles and measure them in degrees Identify Angle at a point and one whole turn (total 360°) Angles at a point a point on a straight line and ½ a turn (total 180°) Other multiples of 90° 	<ul style="list-style-type: none"> Find unknown angles in any triangles, quadrilaterals and regular polygons Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles



KS1-KS2 Maths Objective Overview (2022-23)

Geometry: Positions and direction		<ul style="list-style-type: none">Describe position, direction and movement, including whole, half, quarter and three-quarter turns	<ul style="list-style-type: none">Order and arrange combinations of mathematical objects in patterns and sequencesUse mathematical vocabulary to describe position, direction and 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 anticlockwise)		<ul style="list-style-type: none">Describe positions on a 2-D grid as coordinates in the first quadrantDescribe movement between positions as translations of a given unit to the left/right and up/downPlot specified points and draw sides to complete a given polygon	<ul style="list-style-type: none">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	<ul style="list-style-type: none">Describe position on the full coordinates (all four quadrants)Draw and translate simple shapes on the coordinate plane and reflect them in the axes
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KS1-KS2 Maths Objective Overview (2022-23)



		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics: Present and Interpret			<ul style="list-style-type: none"> Interpret and construct simple pictograms, tally charts, block diagram and simple tables 	<ul style="list-style-type: none"> Interprets and present data using bar charts, pictograms and tables 	<ul style="list-style-type: none"> Interprets and present discrete continuous data using appropriate graphical methods, including bar charts and time graphs 	<ul style="list-style-type: none"> Compare, and interpret information in tables, including timetables 	<ul style="list-style-type: none"> Interpret and construct pie charts and line graphs and use these to solve problems
Statistics: Solve Problems			<ul style="list-style-type: none"> Ask and answers simple question by counting the number of objects in each category and sorting the categories by quantity Ask and answer questions about totaling a comparing categorical data 	<ul style="list-style-type: none"> Solve one-step and two step questions, (for example 'How many more?' and 'How many fewer?') using information present in scales bar charts and pictograms and tables 	<ul style="list-style-type: none"> Solve comparison sum and difference problems using information present in bar charts, pictograms, tables and other graphs 	<ul style="list-style-type: none"> Solve comparison sum and difference problems using information presented in a line graph 	<ul style="list-style-type: none"> Calculate and interpret the mean as an average



KS1-KS2 Maths Objective Overview (2022-23)

Notes

Non – Statutory

Strand	Year 1
	Notes and guidance
Number Number and place value	<ul style="list-style-type: none">• Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.• Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.• They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.• They recognise and create repeating patterns with objects and with
Number- addition, subtraction, multiplication and division	<ul style="list-style-type: none">• Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting 0. This establishes addition and subtraction as related operations.• Pupils combine and increase numbers, counting forwards and backwards.• They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.• Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.• They make connections between arrays, number patterns, and counting in 2s, 5s and 10s.
Number- fractions	<ul style="list-style-type: none">• Pupils are taught half and quarter as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. For example, they could recognise and find half a length, quantity, set of objects or shape. Pupils connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.
Geometry – properties of shapes	<ul style="list-style-type: none">• Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. They recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other.
Geometry – position and direction	<ul style="list-style-type: none">• Pupils use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside. Pupils make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.
Measurement	<ul style="list-style-type: none">• The pairs of terms: mass and weight, volume and capacity, are used interchangeably at this stage. Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers. Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past.

KS1-KS2 Maths Objective Overview (2022-23)



Strand	Year 2
	Notes and guidance
Number Number and place value	<ul style="list-style-type: none"> Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. They count in multiples of 3 to support their later understanding of a third. As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations. Pupils should partition numbers in different ways (for example, $23 = 20 + 3$ and $23 = 10 + 13$) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand 0 as a place holder.
Number- addition, subtraction, multiplication and division	<ul style="list-style-type: none"> Pupils extend their understanding of the language of addition and subtraction to include sum and difference. Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition. Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers. Pupils use a variety of language to describe multiplication and division. Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10-multiplication table to place value, and the 5-multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5=4$).
Number- fractions	<ul style="list-style-type: none"> Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers. Pupils use a variety of language to describe multiplication and division. Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10-multiplication table to place value, and the 5-multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5=4$).
Geometry – properties of shapes	<ul style="list-style-type: none"> Pupils use fractions as ‘fractions of’ discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. They meet $\frac{3}{4}$ as the first example of a non-unit fraction. Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (for example, $1 \frac{1}{4}$, $1 \frac{2}{4}$ (or $1 \frac{1}{2}$), $1 \frac{3}{4}$, 2). This reinforces the concept of fractions as numbers and that they can add up to more than 1.
Geometry – position and direction	<ul style="list-style-type: none"> Pupils should work with patterns of shapes, including those in different orientations. Pupils use the concept and language of angles to describe ‘turn’ by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).
Measurement	<ul style="list-style-type: none"> Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. Comparing measures includes simple multiples such as ‘half as high’; ‘twice as wide’. Pupils become fluent in telling the time on analogue clocks and recording it. They become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.
Statistics	<ul style="list-style-type: none"> Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5,10).

KS1-KS2 Maths Objective Overview (2022-23)



Strand	Year 3
	Notes and guidance
Number Number and place value	<ul style="list-style-type: none"> Pupils now use multiples of 2, 3, 4, 5, 8, 10, 50 and 100. They use larger numbers to at least 1,000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, $146 = 100 + 40 + 6$, $146 = 130 + 16$). Using a variety of representations, including those related to measure, pupils continue to count in 1s, 10s and 100s, so that they become fluent in the order and place value of numbers to 1,000.
Number- addition, subtraction, multiplication and division	<ul style="list-style-type: none"> Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100. Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to 3 digits to become fluent Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts ($30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$). Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division. Pupils solve simple problems in contexts, deciding which of the 4 operations to use and why. These include measuring and scaling contexts, (for example 4 times as high, 8 times as long etc) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits? 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).
Number- fractions	<ul style="list-style-type: none"> Pupils connect tenths to place value, decimal measures and to division by 10. They begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence. They should go beyond the [0, 1] interval, including relating this to measure. Pupils understand the relation between unit fractions as operators (fractions of), and division by integers. They continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity. Pupils practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency.
Geometry – properties of shapes	<ul style="list-style-type: none"> Pupils' knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygons and polyhedral. Pupils extend their use of the properties of shapes. They should be able to describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle. Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts.
Geometry – position and direction	<ul style="list-style-type: none"> Pupils draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of co-ordinates, for example (2, 5), including using co-ordinate-plotting ICT tools.
Measurement	<ul style="list-style-type: none"> Pupils continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (for example, 1 kg and 200g) and simple equivalents of mixed units (for example, $5m = 500cm$). The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or 5 times as high) and this connects to multiplication. Pupils continue to become fluent in recognising the value of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. They record £ and p separately. The decimal recording of money is introduced formally in year 4.
Statistics	<ul style="list-style-type: none"> Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy. They continue to interpret data presented in many contexts.

KS1-KS2 Maths Objective Overview (2022-23)



Strand	Year 4
	Notes and guidance
Number Number and place value	<ul style="list-style-type: none"> Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1,000, including counting in 10s and 100s, and maintaining fluency in other multiples through varied and frequent practice. They begin to extend their knowledge of the number system to include the decimal numbers and fractions that they have met so far. They connect estimation and rounding numbers to the use of measuring instruments. Roman numerals should be put in their historical context so pupils understand that there have been different ways to write whole numbers and that the important concepts of 0 and place value were introduced over a period of time.
Number- addition, subtraction, multiplication and division	<ul style="list-style-type: none"> Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency. Pupils practise mental methods and extend this to 3-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$). Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10 \times 6 = 60$. Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or 3 cakes shared equally between 10 children.
Number- fractions	<ul style="list-style-type: none"> Pupils should connect hundredths to tenths and place value and decimal measure. They extend the use of the number line to connect fractions, numbers and measures. Pupils understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths. Pupils make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Pupils use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example, $6/9 = 2/3$ or $1/4 = 2/8$). Pupils continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of increasingly complex problems beyond one whole. Pupils are taught throughout that decimals and fractions are different ways of expressing numbers and proportions. Pupils' understanding of the number system and decimal place value is extended at this stage to tenths and then hundredths. This includes relating the decimal notation to division of whole number by 10 and later 100. They practise counting using simple fractions and decimals, both forwards and backwards. Pupils learn decimal notation and the language associated with it, including in the context of measurements. They make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places. They should be able to represent numbers with 1 or 2 decimal places in several ways, such as on number lines.
Geometry – properties of shapes	<ul style="list-style-type: none"> Pupils continue to classify shapes using geometrical properties, extending to classifying different triangles (for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, trapezium). Pupils compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular. Pupils draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape.
Geometry – position and direction	<ul style="list-style-type: none"> Pupils draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of co-ordinates, for example (2, 5), including using co-ordinate-plotting ICT tools.
Measurement	<ul style="list-style-type: none"> Pupils build on their understanding of place value and decimal notation to record metric measures, including money. They use multiplication to convert from larger to smaller units. Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit. They relate area to arrays and multiplication.
Statistics	<ul style="list-style-type: none"> Pupils understand and use a greater range of scales in their representations. Pupils begin to relate the graphical representation of data to recording change over time.

KS1-KS2 Maths Objective Overview (2022-23)



Strand	Year 5
	Notes and guidance
Number Number and place value	<ul style="list-style-type: none"> • Pupils identify the place value in large whole numbers. • They continue to use number in context, including measurement. • Pupils extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far. • They should recognise and describe linear number sequences (for example, 3, 3 1/2, 4, 4 1/2 ...), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add 1/2).
Number- addition, subtraction, multiplication and division	<ul style="list-style-type: none"> • Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency • They practise mental calculations with increasingly large numbers to aid fluency (for example, $12,462 - 2,300 = 10,162$). • Pupils practise and extend their use of the formal written methods of short multiplication and short division. They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations. • They use and understand the terms factor, multiple and prime, square and cube numbers. • Pupils interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, $98 \div 4 = 98/4 = 24 \text{ r } 2 = 24 \frac{1}{2} = 24.5 \approx 25$). • Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1,000 in converting between units such as kilometres and metres. • Distributivity can be expressed as $(b + c) = ab + ac$. • They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, $4 \times 35 = 2 \times 2 \times 35$; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 9^2 \times 10$). • Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example $13 + 24 = 12 + 25$; $33 = 5 \times ?$)
Number- fractions	<ul style="list-style-type: none"> • Pupils should be taught throughout that percentages, decimals and fractions are different ways of expressing proportions. • They extend their knowledge of fractions to thousandths and connect to decimals and measures. • Pupils connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions. • Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1. • Pupils practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems. They extend their understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number. • Pupils continue to practise counting forwards and backwards in simple fractions. • Pupils continue to develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities. Pupils extend counting from year 4, using decimals and fractions including bridging 0, for example on a number line. • Pupils say, read and write decimal fractions and related tenths, hundredths and thousandths accurately and are confident in checking the reasonableness of their answers to problems. • They mentally add and subtract tenths, and one-digit whole numbers and tenths. • They practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, $0.83 + 0.17 = 1$). • Pupils should go beyond the measurement and money models of decimals, for example, by solving puzzles involving decimals. • Pupils should make connections between percentages, fractions and decimals (for example, 100% represents a whole quantity and 1% is 1/100, 50% is 50/100 and relate this to finding fractions of).

KS1-KS2 Maths Objective Overview (2022-23)



Geometry – properties of shapes	<ul style="list-style-type: none"> • Pupils should be taught throughout that percentages, decimals and fractions are different ways of expressing proportions. • They extend their knowledge of fractions to thousandths and connect to decimals and measures. • Pupils connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions. • Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1. • Pupils practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems. They extend their understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number. • Pupils continue to practise counting forwards and backwards in simple fractions. • Pupils continue to develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities. Pupils extend counting from year 4, using decimals and fractions including bridging 0, for example on a number line. • Pupils say, read and write decimal fractions and related tenths, hundredths and thousandths accurately and are confident in checking the reasonableness of their answers to problems. • They mentally add and subtract tenths, and one-digit whole numbers and tenths. • They practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, $0.83 + 0.17 = 1$). • Pupils should go beyond the measurement and money models of decimals, for example, by solving puzzles involving decimals.
Geometry – position and direction	<ul style="list-style-type: none"> • Pupils recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes.
Measurement	<ul style="list-style-type: none"> • Pupils use their knowledge of place value and multiplication and division to convert between standard units. • Pupils calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths. Missing measures questions such as these can be expressed algebraically, for example $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm. • Pupils calculate the area from scale drawings using given measurements. • Pupils use all 4 operations in problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days).
Statistics	<ul style="list-style-type: none"> • Pupils use their knowledge of place value and multiplication and division to convert between standard units. • Pupils calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths. Missing measures questions such as these can be expressed algebraically, for example $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm. • Pupils calculate the area from scale drawings using given measurements. • Pupils use all 4 operations in problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days).

KS1-KS2 Maths Objective Overview (2022-23)



Strand	Year 6
	Notes and guidance
Number Number and place value	<ul style="list-style-type: none"> • Pupils use the whole number system, including saying, reading and writing numbers accurately.
Number- addition, subtraction, multiplication and division	<ul style="list-style-type: none"> • Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of column addition and subtraction, short and long multiplication, and short and long division when they are ready (see Mathematics Calculation Policy). • They undertake mental calculations with increasingly large numbers and more complex calculations. • Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. • Pupils round answers to a specified degree of accuracy, for example, to the nearest 10,20, 50 etc., but not to a specified number of significant figures. Pupils explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$. • Common factors can be related to finding equivalent fractions.
Number- fractions	<ul style="list-style-type: none"> • Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of column addition and subtraction, short and long multiplication, and short and long division when they are ready • They undertake mental calculations with increasingly large numbers and more complex calculations. • Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. • Pupils round answers to a specified degree of accuracy, for example, to the nearest 10,20, 50 etc., but not to a specified number of significant figures. Pupils explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$. • Common factors can be related to finding equivalent fractions. with fractions where the denominator of one fraction is a multiple of the other (for example, $\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$) and progress to varied and increasingly complex problems. • Pupils should use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle. • Pupils use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (for example, if $\frac{1}{4}$ of a length is 36cm, then the whole length is $36 \times 4 = 144\text{cm}$). • They practise calculations with simple fractions and decimal fraction equivalents to aid fluency, including listing equivalent fractions to identify fractions with common denominators. • Pupils can explore and make conjectures about converting a simple fraction to a decimal fraction (for example, $3 \div 8 = 0.375$). For simple fractions with recurring decimal equivalents, pupils learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context. Pupils multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers. Pupils multiply decimals by whole numbers, starting with the simplest cases, such as $0.4 \times 2 = 0.8$, and in practical contexts, such as measures and money. • Pupils are introduced to the division of decimal numbers by one-digit whole number, initially, in practical contexts involving measures and money. They recognise division calculations as the inverse of multiplication. • Pupils also develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers.

KS1-KS2 Maths Objective Overview (2022-23)



Number – Ratio and Proportion	<ul style="list-style-type: none"> • Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio (for example, similar shapes and recipes). • Pupils link percentages or 360° to calculating angles of pie charts. • Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation $a : b$ to record their work. • Pupils solve problems involving unequal quantities, for example, 'for every egg you need three spoonsful of flour', '$\frac{3}{5}$ of the class are boys'. These problems are the foundation for later formal approaches to ratio and proportion
Number Algebra	<ul style="list-style-type: none"> • Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: missing numbers, lengths, coordinates and angles formulae in mathematics and science equivalent expressions (for example, $a + b = b + a$) • generalisations of number patterns • number puzzles (for example, what two numbers can add up to).
Geometry – properties of shapes	<ul style="list-style-type: none"> • Pupils draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles. • Pupils describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements. • These relationships might be expressed algebraically for example, $d = 2 \times r$; $a = 180 - (b + c)$.
Geometry – position and direction	<ul style="list-style-type: none"> • Pupils draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers. • Pupils draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to $(a - 2, b + 3)$; (a, b) and $(a + d, b + d)$ being opposite vertices of a square of side d.
Measurement	<ul style="list-style-type: none"> • Pupils connect conversion (for example, from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs. • They know approximate conversions and are able to tell if an answer is sensible. • Using the number line, pupils use, add and subtract positive and negative integers for measures such as temperature.
Statistics	<ul style="list-style-type: none"> • Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts. • Pupils both encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects. • They should connect conversion from kilometres to miles in measurement to its graphical representation. • Pupils know when it is appropriate to find the mean of a data set.

KS1-KS2 Maths Objective Overview (2022-23)

