Number and Place Value

Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	count objects, actions and sounds matching one number name to each item subitise to 5 (ELG) and count to check count beyond 20 verbally (ELG)	count to and across 100, forwards, beginning with 0 or 1 count to and across 100, forwards and backwards, beginning with any given number count to and across 100, backwards, beginning with any given number count in multiples of twos begin to recognise odd and even numbers	count in multiples of threes, fives and tens recognise odd and even numbers	count from 0 in multiples of 4 count from 0 in multiples of 8 count from 0 in multiples of 50 and 100 find 10 or 100 more or less than a given number	count in multiples of 6 count in multiples of 7 count in multiples of 9 count in multiples of 25 count in multiples of 1000 find 1000 more or less than a given number	count forwards in steps of powers of 10 for any given number up to 1,000,000 count backwards in steps of powers of 10 for any given number up to 1,000,000 interpret negative numbers in context count backwards through zero to include negative numbers	count forwards in steps of powers of 10 for any given number up to 10,000,000 count backwards in steps of powers of 10 for any given number up to 10,000,000 calculate intervals across zero
Represent	link the number symbol with its cardinal number value to 10 write recognisable numbers to 10	identify and represent one and two digit numbers using objects and pictorial representations* identify and represent numbers using the number line count, read and write numbers to 100 in numerals read and write numbers from 1 to 20 in words	estimate one and two digit numbers using different representations* estimate one and two digit numbers using the number line count, read and write numbers to 100 in numerals and words	identify and represent 3 digit numbers using different representations* identify and represent 3 digit numbers using the number line estimate 3 digit numbers using different representations* estimate 3 digit numbers using the number line read and write numbers up to 1000 in numerals and in words	identify and represent 4 digit numbers using different representations* estimate 4 digit numbers using different representations* identify and represent 4 digit numbers on a number line identify and represent numbers with decimals on a number line estimate 4 digit numbers on a number line estimate numbers with decimals on a number line read Roman numerals to 100 (I to C) understand that Romans did not use zero so could not use place value understand that over time, the numeral system changed to include the concept of zero and place value	read and write numbers to at least 1 000 000 determine the value of each digit for numbers to at least 1000 000 order and compare numbers to at least 1 000 000 read Roman numerals to 1000 (M) recognise years written in Roman numerals	read and write numbers to at least 10 000 000 determine the value of each digit for numbers to at least 10000 000 order and compare numbers to at least 10 000 000

	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Compare	compare quantities up to 10 using the language of greaterthan/less than, more than,/fewer, the same (ELG) understand the one more/one less relationship between consecutive numbers	given a number, identify one more and one less use the language of equal to, more than, less than, most, least, (fewer) know and use <, > and = signs for numbers within 10	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	recognise the place value of each digit in a three-digit number (hundreds, tens, ones) compare and order numbers up to 1000	find 1 000 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 round any number to the nearest 10 round any number to the nearest 100 round any number to the nearest 1000	determine the value of each digit to at least 1,000,000 order and compare numbers to at least 1,000,000 round any number up to 1,000,000 to the nearest 10 round any number up to 1,000,000 to the nearest 100 round any number up to 1,000,000 to the nearest 1000 round any number up to 1,000,000 to the nearest 10,000 round any number up to 1,000,000 to the nearest 100,000	determine the value of each digit up to 10,000,000 order and compare numbers up to 10,000,000 round any whole number to a required degree of accuracy
Reasoning and Problem Solving (refer to skills at the end of the document)	recognise the pattern of the counting system counting verbally	solve problems related to place value and number	solve problems related to place value and number	solve number problems and practical problems involving these ideas	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above
Terminology	more, less, fewer, number, count, check, same, different, amount	digit, numeral, figure(s), compare, order/a different order, size, value, between, halfway between, above, below, tens, ones	numbers to one hundred, hundreds, partition, recombine	numbers to one thousand	tenths, hundredths, decimal (places), round (to nearest), thousand more/less than, negative integers, count through zero, Roman numerals I to C	powers of ten	numbers to ten million
Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Recall, Represent and Use	automatically recall numberbonds to 5 (ELG) automatically recall some number bonds to 10 (ELG)	read, write and interpret mathematical statements involving addition (+) and equals (=) signs read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs represent and use number bonds within 20 represent and use subtraction facts related to number bondswithin 20	recall and use addition and subtraction facts to 20 use + and - facts up to 100 related to known addition andsubtraction facts to 20, understand that addition of two numbers can be done inany order (commutative) understand that subtraction ofone number from another cannot be done in any order recognise the inverse relationship between additionand subtraction	estimate the answer to a calculation use inverse operations to check answers	estimate and use inverse operations to check answers toa calculation independently	use rounding to check answers determine levels of accuracy	use estimation to check answers determine an appropriate degree of accuracy
Calculations	understand different ways of making numbers up to 10 (ELG) use visual representations* such as part-part whole up to10	add and subtract one-digit and two-digit numbers to 20,including zero	add and subtract a two-digit number and ones using concrete objects, pictorial representations*, and mentally add and subtract a two-digit number and tens using concrete objects, pictorial representations*, and mentally add and subtract two two-digit numbers using concrete objects, pictorial representations*, and mentally add three one-digit numbers use the inverse relationship between addition and subtraction to check calculations	add and subtract a three-digit number and ones mentally add and subtract a three-digit number and tens mentally add and subtract a three-digit number and hundreds mentally add and subtract numberswith up to three digits, usingformal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formalwritten methods (columnar addition and subtraction) add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers use their knowledge of the order of operations to carry outcalculations involving the four operations
Reasoning and Problem Solving	solve real world mathematical problems with numbers up to ten	solve one-step problems that involve addition and subtraction	show that addition of two numbers can be done in any order (commutative) and subtraction of one number solve problems with additionand subtraction involving quantities solve problems with additionand subtraction involving measures derive + and – facts up to 100 related to known addition and subtraction facts to 20	solve problems, including missing number problems, using more complex additionand subtraction	solve addition and subtractiontwo-step problems in contexts	solve addition and subtraction multi-step problems in contexts	

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Terminology	number bonds, more, less, altogether, count on, count back, part, whole	number line, add, plus, make, sum, total, near double, equals, is the same as (including equals sign), difference between, subtract, take away, minus, how many…?, how much…?	Inverse, bar model	column addition and subtraction	inverse operation	efficient written method	order of operations
Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recall, Represent and Use	double numbers and quantities of objects up to 5+5 (ELG) recognise even and odd numbers to 10 (ELG)	double numbers and quantities of objects to 20 halve numbers and quantities of objects to 10	recall and use multiplication facts for the 2 times table recall and use multiplication facts for the 5 times table recall and use multiplication facts for the 10 times table understand that multiplication of two numbers can be done in any order (commutative) recall and use division facts for the 2 times table recall and use division facts for the 5 times table recall and use division facts for the 10 times table understand division of one number by another cannot be done in any order start to recognise the inverse relationship between multiplication and division	recall and use multiplication facts for the 3 times table recall and use multiplication facts for the 4 times table recall and use multiplication facts for the 8 times table recall and use division facts for the 3 times table recall and use division facts for the 4 times table recall and use division facts for the 8 times table recognise the inverse relationship between multiplication and division	recall multiplication and division facts for the 6 timestable recall multiplication and division facts for the 7 timestable recall multiplication and division facts for the 9 timestable recall multiplication and division facts for the 11 timestable recall multiplication and division facts for the 12 timestable multiply and divide by 1 multiply by 0 recognise and use factor pairs in mental calculations recognise and use commutativity in mental calculations use place value and known facts to multiply three numbers together	identify multiples identify factors find all factor pairs of a number find common factors of two numbers know and use the vocabulary of prime numbers know and use the vocabulary of prime factors know and use the vocabulary of composite (non-prime) numbers establish whether a number up to 100 is prime recall prime numbers up to 19 recognise and use square numbers, and the notation for squared (^{2}) recognise and use cube numbers, and the notation for cubed (^{3})	identify common factors identify common multiples identify prime numbers use estimation to check answers determine appropriate levels of accuracy

| Calculations | share even objects to 10, recognising that numbers can be split equally (ELG) | calculate simple multiplication and division answers using concrete objects

calculate simple multiplication and division answers using pictorial representations*

calculate simple multiplication and division answers using arrays, with the support of the teacher | calculate mathematical statements for multiplication within the tables they know

write mathematical statements using the multiplication (×) and equals (=) signs

calculate mathematical statements for division within the tables they know

write mathematical statements using the division (÷) and equals (=) signs | calculate mathematical statements for multiplication within the tables they know

calculate two-digit numbers times one-digit numbers using mental methods

calculate mathematical statements for division within the tables they know

start to use formal written methods | multiply two-digit and three-digit numbers by a one-digit number using a formal written layout | multiply numbers up to 4 digits by a one-digit number using a formal written method

multiply numbers up to 4 digits by a two-digit number using long multiplication

divide numbers up to 4 digits by a one-digit number using the formal written method of short division

multiply and divide whole numbers by 10
multiply and divide numbers involving decimals by 10
multiply and divide whole numbers by 100 and 1000
multiply and divide numbers involving decimals by 100 and 1000 | 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 short division where appropriate

divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division

perform mental calculations with mixed operations

perform mental calculations with large numbers

use knowledge of the order of operations to carry out calculations

multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places |
|---|---|---|---|---|---|---|---|
| **Reasoning and Problem Solving**

(refer to skills at the end of the document) | solve real world mathematical problems with numbers to 10 and beyond ten | solve one-step problems involving multiplication and division as above

make connections between arrays, number patterns and counting in twos, fives and tens | solve problems involving multiplication and division as above, including problems in contexts

show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | solve problems involving multiplication and division

solve positive integer scaling problems

solve correspondence problems in which n objects are connected to m objects

extend known one-digit facts to two digit numbers by derivation (e.g. 2x3=6 so 20 x 3 =60) | solve problems involving multiplying and adding

solve using the distributive law to multiply two digit numbers by one digit

solve integer scaling problems

solve harder correspondence problems such as n objects are connected to m objects

extend known two-digit facts to three digit numbers by derivation (e.g. 20 x 3 =60, 60 ÷3= 20, so 600 ÷3=200) | solve problems involving using their knowledge of factors and multiples

solve problems involving using their knowledge of squares and cubes

solve problems involving simple rates

solve problems combining two of addition, subtraction, multiplication and division

multiply and divide numbers mentally drawing upon known facts

interpret remainders appropriately for the context | solve multi-step problems involving addition, subtraction, multiplication and division

interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

solve problems of relative sizes using integer multiplication and division facts to find missing values

solve problems involving enlarging or reducing similar shapes where the scale factor is known

solve problems involving enlarging or reducing similar shapes where the scale can be found |

Terminology (refer to skills at the end of the document)	double, half, halve, share, share equally, group in twos, threes etc., equal groups of, total	once, twice, three times, five times, multiply, multiply by, repeated addition, array, row, column, divide, divided by, leftover, pair	multiple of times multiplication from another cannot solve problems with addition and subtraction involving numbers	product, multiples of four, eight, fifty and one hundred, scale up	multiplication facts (up to 12x12), division facts, derive	factor pairs, composite numbers, prime number, prime factors, square number, cubed number, formal written method	common factors, common multiples
Themes within subject	**Year R**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Recognise and Write	recognise that a group of objects can be shared equally between two people (ELG)	recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	recognise and find fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity 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	count up and down in tenths recognise that tenths arise from dividing an object into 10 equal parts recognise that tenths arise from dividing one-digit numbers or quantities by 10 recognise, find and write unit fractions of a discrete set of objects: recognise, find and write non-unit fractions (with small denominators) of a discrete set of objects recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	count up and down in hundredths recognise that hundredths arise when dividing an object by one hundred recognise that hundredths arise when dividing tenths by ten	recognise mixed numbers and improper fractions convert between mixed numbers and improper fractions write mathematical statements > 1 as a mixed number, e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$	move freely between numerical and pictorial representations, e.g. equivalent fractions, fractions and decimals
Compare		recognise the equivalence of two halves and four quarters, using objects or shapes	recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	recognise equivalent fractions with small denominators use diagrams to show equivalent fractions with small denominators compare and order unit fractions compare and order fractions with the same denominators	recognise families of common equivalent fractions Use diagrams to show families of common equivalent fractions	identify, name and write equivalent fractions of tenths and hundredths, represented visually identify, name and write equivalent fractions of other given fractions, represented visually compare and order fractions whose denominators are all multiples of the same number	use common factors to simplify fractions use common multiples to express fractions in the same denomination compare and order fractions <1 compare and order fractions >1

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Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Calculations		recognise that two halves, or four quarters, make a whole	write simple fractions, e.g. $\frac{1}{2}$ of 6 = 3	add and subtract fractions with the same denominator within one whole, e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$	add and subtract fractions with the same denominator	add and subtract fractions with denominators that are multiples of the same number; multiply proper fractions by whole numbers, (supported by materials and diagrams); multiply mixed numbers by whole numbers, (supported by materials and diagrams)	use equivalent fractions to add and subtract fractions with different denominators; use equivalent fractions to add and subtract mixed numbers; multiply simple pairs of proper fractions, writing the answer in its simplest form, e.g. 1/4 × 1/2 = 1/8; divide proper fractions by whole numbers, e.g. 1/3 ÷ 2 = 1/6
Reasoning and Problem Solving (refer to skills at the end of the document)				solve problems that involve all of the above	solve problems involving increasingly harder fractions to calculate quantities; solve problems involving fractions to divide quantities, including non-unit fractions where the answer is a whole number	solve problems involving scaling by simple fractions	use knowledge of fractions and multiples to solve ratio and proportion problems involving unequal sharing and grouping
Recognise and Write				connect tenths to place value	recognise and write decimal equivalents of any number of tenths; recognise and write decimal equivalents of any number of hundredths; recognise and write decimal equivalents to $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$	read and write decimal numbers as fractions (e.g. 0.71 = 71/100); recognise and use thousandths; relate thousandths to tenths, hundredths and decimal equivalents	identify the value of each digit in numbers given to three decimal places
Compare				connect tenths to decimal measures and to division by 10	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)	round decimals with two decimal places to one decimal place; round decimals with two decimal places to the nearest whole number; read, write, order and compare numbers with up to three decimal places	round decimals, including those within measure, with three decimal places to the nearest whole number; round decimals, including those within measure, with three decimal places to one decimal place
Calculations					find the effect of dividing a one- or two-digit number by 10; identify the value of the digits in answers as ones and tenths; find the effect of dividing a one- or two-digit number by 100; identify the value of the digits in answers as tenths and hundredths		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

	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions, Decimals and Percentages						recognise the percent symbol(%) understand that per cent relates to "number of parts perhundred" write percentages as a fraction with denominator 100 write percentages as a decimal	associate a fraction withdivision calculate decimal equivalents for a simple fraction, e.g. ³/₈ =0.375 recall equivalences between simple fractions, decimals andpercentages, use equivalences between simple fractions, decimals andpercentages in different contexts
Reasoning and Problem Solving (refer to skills at the end of the document)					solve simple measure and money problems involving fractions and decimals to two decimal places	solve problems involving numbers up to three decimalplaces solve problems which require knowing percentage and decimal equivalents of ¹/₂, ¹/₄,¹/₅, ²/₅, ⁴/₅ solve problems which require knowing percentage and decimal equivalents of fractions with a multiple of 10or 25 as the denominator	solve problems involving the calculation of percentages [for example, of measures, such as15% of 360] solve problems involving theuse of percentages for comparison
Terminology	share equally, half	whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters	three quarters, one third, a third, equivalence, equivalent	numerator, denominator, unit fraction, non-unit fraction, compare and order, tenths	equivalent decimals and fractions	proper fractions, improper fractions, mixed numbers, percentage, half, quarter, fifth,two fifths, four fifths, ratio, proportion	degree of accuracy, simplify

Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algebra		solve missing number problemssuch as □ - 9 = 7 solve missing number problemsby guessing and checking	use the inverse relationship between addition and subtraction to solve missing number problems	solve missing number problemsin addition and subtraction, with the range of numbers known so far solve missing number problemsin multiplication and division, with the range of numbers known so far use the inverse relationship between multiplication and division to solve missing numberproblems	solve more complex missing number problems	recognise simple formulae given in words Start to recognise the same formulae in symbols describe simple linear number sequences in words (e.g. sequences like 2n, 2n+1) identify what a later term, in simple linear number sequences, might be withoutidentifying the term before, e.g. 2, 4, 6, -, ?,	use simple formulae such as for angles and areas, and speed generate and describe linear number sequences express missing number problems algebraically find pairs of numbers that satisfy an equation with twounknowns enumerate possibilities of combinations of two variables

Terminology		split, separate, explain, problem missing number	predict, describe, record, order	rule	solution	formulae	linear number sequence, substitute, variables, symbol, known values
Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measure	use comparative language to group objects	solve practical problems for lengths and heights solve practical problems for capacity and volume	nearest appropriate unit, using measuring vessels compare and order volume/capacity and record the results using >, < and =			compare the area of different shaped rectangles (including squares estimate the area of irregular shapes estimate volume, e.g. using 1cm³ blocks to build cuboids (including cubes) estimate capacity, e.g. using water use all four operations to solve problems involving volume using decimal notation solve scaling problems involving volume	recognise that shapes with the same areas can have different perimeters and vice versa recognise when it is possible to use formulae for area of shapes calculate the area of triangles calculate the area of parallelograms recognise when it is possible to use formulae for volume of shapes estimate, calculate and compare volume of cubes and cuboids using cm³ and m³ calculate volume of cubes and cuboids using mm³ and km³ solve problems involving the calculation and conversion of units of volume using decimals reason about connections between area of a triangle and area of rectangles and trapezium.
Temperature		compare and describe temperature e.g. hot/warm/cold, hotter/colder	estimate and measure temperature (°C), using thermometers			measure temperature when negative	add and subtract temperatures that include negatives

Mass and Weight	compare weight, using comparative language, such as 'heavier than' use comparative language to group objects	Compare and describe mass and weight, e.g. heavy/light, lighter than measure and begin to record mass/weight solve practical problems for mass/weight	choose and use the appropriate standard unit to estimate mass (kg/g) measure mass (kg/g) to the nearest appropriate unit, using scales compare and order mass, and record the results using >, < and =	compare mass (using kg/g) add and subtract mass (kg/g)	start to convert between different units of measure, e.g. kilogram to gram with simple numbers calculate in grams and kilograms	convert between different units of metric measure - gram and kilogram understand and use approximate equivalences between grams and pounds, kg and stone use all four operations to solve problems involving mass, using decimal notation solve scaling problems including mass	use, read and write standard units of mass using up to three decimal places convert between standard units of mass, using up to three decimal places solve problems involving the calculation and conversion of units of mass
Money	begin to use everyday language related to money in role play	recognise and know the value of different denominations of coins and notes	recognise and use symbols for pounds (£) and pence (p) combine amounts to make a particular value find different combinations of coins that equal the same amounts of money solve simple problems in a practical context involving addition of money of the same unit solve simple problems in a practical context involving subtraction of money of the same unit, including giving change	add and subtract amounts of money to give change, using both £ and p in practical contexts	estimate, compare and calculate money in pounds and pence	use all four operations to solve problems involving money, using decimal notation solve scaling problems with money	use all four operations to solve more complex problems involving money and decimals solve scaling problems with money and decimals

Length							
	compare length, using comparative language, suchas 'than' use comparative language to group objects	measure and begin to record lengths and heights compare and describe lengthsand heights, e.g. long/short, longer/shorter, tall/short, double/half solve practical problems for lengths and heights	choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm estimate and measure length/height (m/cm), to the nearest appropriate unit, using rulers compare and order lengths and record the results using >, < and =	measure and compare lengths (m/cm/mm) add and subtract lengths (m/cm/mm) measure the perimeter of simple 2-D shapes	start to convert between different units of measure, e.g.kilometre to metre; estimate and compare in mm,cm and m calculate in mm, cm and m measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	convert between km & m, cm& m, cm & mm understand and use approximate equivalences between inches and cm, andfeet and metres measure the perimeter of composite rectilinear shapes incentimetres and metres calculate the perimeter of composite rectilinear shapes incentimetres and metres use all four operations to solve problems involving length using decimal notation solve scaling problems involving length	use, read and write standardunits of length using decimalnotation to up to three decimal places convert between standard units of length using decimalnotation to up to three decimal places convert between miles and km solve problems involving the calculation and conversion ofunits of length using decimals
Time	use everyday language related to time order and sequence two orthree familiar events measure short periods of timein simple ways	compare and describe time, e.g. quicker, slower, earlier,later sequence events in chronological order using language e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening recognise and use languageof dates - days of the week, weeks, months and years tell the time to the hour andhalf past the hour draw the hands on a clock face to show the time to thehour and half past the hour measure and begin to recordtime (hours, minutes, seconds) solve practical problems fortime	compare and sequenceintervals of time tell and write the time to five minutes, including quarter past/to the hour draw the hands on a clock face to show the times to fiveminutes, including quarter past/to the hour know the number of minutes inan hour and the number of hours in a day	tell and write the time from an analogue clock with normal numbers tell and write the time from an analogue clock with Roman numerals from I to XII tell and write the time from an analogue 24 hour clock use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight estimate and read time with increasing accuracy to the nearest minute record and compare time in terms of seconds, minutes andhours know the number of seconds ina minute know the number of days ineach month, year and leapyear compare durations of events e.g. to calculate the time taken by particular events ortasks	convert between minutes and seconds convert between hours and minutes convert between years and months, weeks and days estimate in seconds, minutesand hours compare and calculate in seconds, minutes and hours convert time between analogue and digital 12-hourand 24-hour clocks solve simple problems involving converting units	understand the difference between writing hours and minutes e.g. 2:15, and writing hours as a decimal e.g. 2.25 hours solve problems involving 1 or 2step conversion between units	convert between standard units of time as needed, usingup to three decimal places

Terminology	days of the week, before, after, next, last, now, soon, early, late, quick, quicker, quickest, quickly, fast, faster, fastest, slow, slower, slowest, slowly, old, older, oldest, new, newer, newest, once, twice, first, second, third, etc., money, coin, penny, pence, pound, measure	time, seasons, hour, o'clock, half past, clock, watch, hands, always, never, often, sometimes, usually, estimate, close to, about the same as, just over, just under, too many, too few, not enough, enough, length, width, height, depth, long, longer, longest, short, shorter shortest, tall, taller, tallest, high, higher, highest, Low, wide, narrow, deep, shallow, thick, thin, far, near, close, metre, ruler, metre stick, price, cost, buy, sell, spend, spent, pay, change, costs more, costs less, cheaper, costs the same as	quarter past/to, centimetres, metres, kilometres, grams, kilograms, millimetres, litres, temperature, degrees	leap year, twelve-hour/twenty-four-hour clock, Roman numerals I to XIII	convert, perimeter, area	volume, imperial units, metric units conversion	
Area and Volume	**compare capacity, using comparative language, such as 'than'**	**measure and begin to record capacity and volume** **Compare and describe capacity and volume,** e.g. full/empty, more than, less than, half, half full, quarter	choose and use appropriate standard units to estimate and measure capacity (litres/ml) using measuring vessels estimate and measure capacity (litres/ml), to the	measure and compare volume/capacity (l/ml) add and subtract volume/capacity (l/ml)	find the area of rectilinear shapes by counting squares	convert between l & ml understand and use approximate equivalences between pints and litres calculate the area of rectangles (including squares), in cm² and m²	use, read and write standard units of volume using decimal notation to up to three decimal places convert between standard units of volume using decimal notation to up to three decimal places

Shapes

Note: In this section, problem solving and reasoning are integrated into the different themes, separated by a dotted line. See progression at the end of the document when teaching problem solving and reasoning.

Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
2D Shapes	see how a shape can have other shapes within it e.g. two triangles can make a square develop spatial reasoning skills by selecting, rotating and manipulating shapes select, rotate and manipulate shapes in order to develop spatial reasoning skills.	recognise and name rectangles (including squares), circles and triangles	recognise and name quadrilaterals, pentagons, hexagons, octagons describe the number of sides of shapes met so far identify any line symmetry in a vertical line for shapes met so far compare and sort common 2-D shapes and everyday objects compare and sort common 3-D shapes and everyday objects	draw 2-D shapes identify whether polygons are regular or irregular identify line symmetry as a property of regular polygons identify whether polyhedra seen in 3D are regular or irregular	recognise and name rhombus, parallelogram, trapezium identify equilateral, isosceles and scalene triangles identify lines of symmetry in 2-D shapes in different orientations compare and classify different quadrilaterals based on their properties compare and classify different triangles, based on their properties complete a simple symmetric figure with respect to a specific line of symmetry compare and classify 3-D shapes based on their properties	understand that in a rectangle opposite sides are parallel and equal understand the difference between interior and exterior angles understand that in a rectangle interior angles are 90° understand that in a rectangle interior angles add up to 360° understand that in a rectangle diagonals are same length and bisect (halve) each other use the properties of rectangles to find missing lengths use reasoning about equal sides and angles to distinguish between regular and irregular polygons	understand that in a triangle angles add up to 180° understand that in an equilateral triangle each angle is 60° understand that in an isosceles triangle two angles are equal understand that in a quadrilateral, interior angles add up to 360° understand that in a regular polygon, exterior angles add up to 360° draw 2-D shapes using given dimensions and angles illustrate and name radius, diameter and circumference know that the diameter is twice the radius compare and classify geometric shapes based on their properties and sizes find unknown angles in any triangles, quadrilaterals, and regular polygons

Angles and Lines				recognise angles as a description of a turn recognise angles as a property of shape identify right angles recognise that two right angles make a half-turn, three 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 identify pairs of perpendicular and parallel lines	identify acute and obtuse angles compare and order angles up to two right angles by size	know angles are measured in degrees draw given angles, and measure them in degrees (°) understand angles at a point make one whole turn (total 360°) understand angles at a point on a straight line make half a turn (total 180°) identify other multiples of 90° estimate and compare acute, obtuse and reflex angles use the properties of rectangles to deduce related facts and find missing angles	understand vertically opposite angles are equal find unknown angles in any triangle, in quadrilaterals, and in regular polygons find unknown angles using angles at a point, angles on a straight line and vertically opposite angles
3D Shapes	copy increasingly complex 2D pictures and patterns with these 3D resources see how a shape can have other shapes within it e.g. squares on the faces of a cube	recognise and name cubes, pyramids and spheres identify that circles are round, but really spheres are spherical	recognise and name cuboids, cylinders, other prisms and cones describe the number of edges, vertices and faces identify 2-D shapes on the surface of 3-D shapes, e.g. a circle on a cylinder and a triangle on a pyramid	make 3-D shapes using modelling materials recognise and name regular pyramid (tetrahedron) seen in 3D recognise and name hexahedron and octahedron seen in 3D recognise 3-D shapes in different orientations and describe them		identify cubes and other cuboids, from 2-D representations identify pyramids, cylinders, cones and prisms from 2-D representations identify hexahedron and octahedron from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets

| **Position and Direction** | use positional language such as top, bottom, middle, between, inside

describe their relative position such as 'behind' or 'next to' or 'in front' | describe position, using words like left, right, top, middle, bottom, on top of, in front of, above, between around, near, close, far, inside, outside

describe their own movement using words like forwards, backwards, sideways, left, right, up, down

describe their own turning movement, including whole, half, quarter and three-quarter turns | describe movement of another person or robot using mathematical words like straight line, rotation, left, right

describe rotation of another person or robot as clockwise or anti-clockwise

describe rotation of another person or robot as a number of right angles for quarter, half and three-quarter turns | | describe positions on a 2-D grid using coordinates in the first quadrant

describe movements between positions as translations of a unit to the left/right and up/down

plot specified points and draw sides to complete a given polygon | identify and draw the position of a shape following a reflection in lines parallel to the axes

describe the position of a shape reflected in lines parallel to the axes, using language like coordinates, mirror line, image

understand that reflection does not change a shape (the shape is 'flipped')

identify and draw the position of a shape following a translation

describe the position of a translated shape, using language like coordinates, translated _ left and _ down

understand that translation does not change a shape (the shape slides to a new position) | describe positions on the full coordinate grid (all four quadrants)

draw and translate rectangles, parallelograms and rhombuses

draw and reflect rectangles, parallelograms and rhombuses in the axes |
| **Terminology** | before, after, beside, next to, opposite, apart, between, middle, make, build, draw | edge, centre, direction, journey, left, right, across, close, far, near, along, through, to, from, towards, away from, movement, slide, roll, turn, whole turn, half turn, stretch, bend, corner (point, pointed), face, side, edge, | rotation, clockwise, anticlockwise, straight line, ninety degree turn, right angle, size, bigger, larger, smaller, symmetrical, line of symmetry, fold, match, mirror line, reflection | horizontal, perpendicular and parallel lines, greater/less than ninety degrees, orientation (same orientation, different orientation) | quadrilaterals, triangles, right angle, acute and obtuse angles, co-ordinate, translate, quadrant, X-axis, Y-axis | regular and irregular polygons, reflex angle, dimensions, vertices, mirror line, reflect, image | vertically opposite (angles), circumference, radius, diameter, four quadrants (for co-ordinates) |

Statistics

Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Present and Interpret	count how many objects share a particular simple property present results using practical resources, pictures, drawings or numerals	interpret simple tables present results using lists and simple tables, with support	interpret tally charts, e.g. how many____are there? interpret simple pictograms with simple ratios 1, 2, e.g. how many of x are there? interpret simple pictograms with simple ratios 10, 5, e.g. how many of x are there? interpret block diagrams count objects in different categories showing the results in a simple table construct tally charts construct simple pictograms (ratio 2 or 10) construct block diagrams	interpret data in more complex tables interpret pictograms with ratio 3, 5, 20 interpret bar charts with a scale of 2 units per cm interpret bar charts with scales of 5 or 10 units per cm present data using bar charts with a scale of 2 units per cm present data using bar charts with a scale of 5 or 10 units per cm present data using pictograms with a ratio of 2, 5 or 10 present data using tables	understand that bar charts and pictograms show discrete data interpret bar charts with more complex scales e.g. scales of 20, 100 present data using bar charts with a scale of 5 or 10 units per cm understand that time graphs show continuous data interpret simple time graphs present continuous data in time graphs	read and interpret information in complex tables, including timetables read information presented in a line graph e.g. conversion between known imperial and metric measures or temperature at different times of day	interpret pie charts construct pie charts construct line graphs with two variables interpret the mean as an average calculate the mean identify when it is appropriate to calculate the mean and when not
Reasoning and Problem Solving (refer to skills at the end of the document)		compare how many objects there are in simple categories shown in a table e.g. are there more apples or more oranges?	solve problems that need adding up of objects in different categories compare how many objects there are in different categories, e.g. which fruit is there most of? ask a friend a question that needs adding up or comparing sort objects in different categories by quantity	use information from tables to solve one-step and two-step questions, e.g. 'How many more?' and 'How many fewer?' use information from pictograms to solve one-step and two-step questions use information from scaled bar charts to solve one-step and two-step questions	solve a mix of comparison, sum and difference problems using information from bar charts or pictograms solve simple comparison, sum and difference problems using information from time graphs make links between a time graph and a story e.g. tell a story to match a simple graph	solve multi step problems using information presented in a line graph complete missing information in complex tables, including timetables	use pie charts to solve problems use line graphs to solve problems identify simple relationships in line graphs e.g. the line shows that __is double ___
Terminology	set, list, information, order, count,	table, label, title, tally, match	vote, graph, block graph, pictogram, represent, most popular, most common, least popular, least common	chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axe	discrete data, continuous data, time graph	line graph	mean, pie chart, construct

Reasoning and Problem Solving

Themes within subject	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Reasoning	recognise and describe simple repeating patterns involving numbers or shapes e.g. AABBAABB, ABCABC continue simple repeating patterns involving numbers or shapes create simple repeating patterns involving numbers or shapes say what they are trying to find out sort familiar objects into three or more obvious groups e.g. different colours sort familiar objects into two or more groups based on comparisons e.g. long/short/dark/light describe ways they have sorted objects using comparative language e.g. longer/shorter	recognise, describe and continue more complex patterns involving numbers or shapes create more complex patterns involving numbers or shapes give reasons to justify what might come next in a simple sequence of shapes or numbers make predictions and test these with examples, using mathematical language with support, answer a question by recording information in lists and simple tables say what they have found out explain why an answer is correct or incorrect use diagrams (e.g. three separate circles) to sort objects into three or more separate groups according to a given criterion suggest a different criterion for grouping the same objects	respond to 'What if...?' questions, making predictions based on mathematical knowledge justify their reasoning logically, using phrases, such as 'I know that... so... ' or 'I am sure of that because...' describe and explain decisions and methods chosen explain what they have found out using mathematical language record work and results in lists and simple tables use a simple Venn diagram (two overlapping circles) to sort objects into three groups – x; y; and both x and y	suggest a line of enquiry (questions that could be asked) start to understand a general statement by finding particular examples that match that statement identify examples for which the statement is true or false test out a statement or prediction further, with examples that are checked systematically to make sure none are missed record work and results in tables, bar charts or diagrams check work and justify answers/conclusions logically	make a prediction or general statement involving numbers or shapes systematically collect and organise information to test out statements or questions find a counter example to disprove a statement provide a logical argument that has a complete chain of reasoning to it, using phrases and words, such as 'because...', 'therefore...', 'and so...', 'that leads to...', 'which means that...' explain reasoning using diagrams, graphs and text in making conclusions, spot patterns in results and suggest generalisations and rules use a Venn diagram of two overlapping circles inside a rectangle to show x; y; x and y; and neither x nor y	suggest, plan and develop lines of enquiry and hypotheses identify patterns within linear number sequences express generalisations and proofs using symbolic notation as well as words search for a solution by trying out own ideas and justifying solutions use both examples and counter-examples to justify conclusions, explaining use use simple known facts (e.g. properties of rectangles) to calculate answers, explaining the method clearly use simple known facts (e.g. properties of rectangles) to generalise further, explaining the method clearly.	generate sequences and start to understand the idea of an expression, such as 2n, 2n+1 and n² express generalisations algebraically develop and evaluate lines of enquiry decide how best to represent conclusions decide what further questions to ask explain reasoning using precise mathematical language give mathematical justifications and proof, using logical arguments make use of complex Venn diagrams to illustrate classifying, e.g. geometry apply known mathematical facts, e.g. properties of angles, lines and shapes to calculate answers

ProblemSolving						
	think aloud how to work thingsout answer questions by choosingand using suitable equipment record simple numerical andpictorial representations use concrete objects to work out the answer explain to an adult how they worked out the answer	identify what the question means identify the key information given in a one-step puzzle or word problem identify the operation neededto solve a one-step puzzle or word problem use concrete objects or pictures to help work out theanswer use arrays to help work out the answer with support of an adult check the answer in the context of the problem to be sure it makes sense show the working out and the answer clearly try a range of possible solutions to solve problems	identify the key information in atwo-step puzzle or word problem, where the two steps are shown in the question identify the operations neededto solve a two-step word problem, where the two steps are shown in the question suggest a way to solve a problem apply their increasing knowledge of mental and written methods use multiplication and division methods as needed, e.g. arrays, repeated addition, recognise and use connections between current mental methods and facts. adopt a suggestion by an adult or their peers use lists and tables to organise and interpret given information, with support use diagrams to find a solution, with support begin to work systematically check work for mistakes, including considering appropriate units	identify the key information in atwo-step puzzle or word problem identify and order the operations needed to solve atwo-step word problem identify any resources needed re-phrase a problem in theirown words represent a puzzle or problem using number sentences, statements and diagrams use lists and tables to organise and interpret information recognise and use connections between current and past problems use diagrams to find a solution record with a clear ordered structure search for a solution by trying out own ideas understand there can be different viable solutions to the same problem	break down a problem into steps explain why particular information is key, in two-stepproblems explain why particular operations are the right ones touse, in two-step problems identify the method to use andwhy, in two-step problems tabulate systematically the information in a puzzle or problem pose similar problems to a partner choose resources appropriate to the task find more than one solution, where appropriate, and check their work in the context of the problem check results independently, looking for errors and ways to improve develop their own methods of logically recording	choose the best way to represent the information in aproblem, e.g. verbal description, tables, charts, pictures, database, diagramsetc. decide which operations touse and why, for multi-step problems decide which methods to useand why, for multi-step problems make connections to previous work to suggest ways to tackle complex problems record the steps or calculations needed to solve a problem, using symbols where appropriate present information/results in a clear and organised way, including using ICT if appropriate check methods and work independently, looking for errors and ways to improve use the meaning of the equalssign as equivalence in laying out a problem, e.g. 4x35 = 2x2x35 reflect on others' explanations, methods and strategies, and use these to improve their own work	solve problems by breaking down complex problems intosimpler steps or tasks try alternative approaches and resources to overcome difficulties, including ICT turn simple expressions and formulae from symbols to words and vice-versa round answers to specific degrees of accuracy using awide range of units estimate and give solutions to an appropriate degree of accuracy use letters and symbols to represent unknown numbers and variables, e.g. in a table, formula or equation
Terminology	create, continue, copy, repeat, repeating pattern,carry on, answer	justify, sequence, word problem, operation, workingout	two-step, list, table, organise, reasoning, logical	general statement, systematic, diagram, number sentence	errors, test out, chain of reasoning, conclusion	symbol, generalisation, counter-example, proof	general term, algebraic

Appendices:
*Progression of representations and written methods / calculations (school specific, linked to scheme)