Numeracy
Foundation Phase

Strands	Elements	Reception	Year 1	Year 2
Developing numerical reasoning	**Identify processes and connections**	• transfer mathematical skills to play and classroom activities • identify steps to complete the task or reach a solution • select appropriate mathematics and techniques to use • select and use relevant number facts and mental strategies • select appropriate equipment and resources • use knowledge and practical experience to inform estimations		
	Represent and communicate	• use everyday and mathematical language to talk about their own ideas and choices • present work orally, pictorially and in written form, and use a variety of ways to represent collected data • devise and refine informal, personal methods of recording, moving to using words and symbols in number sentences		
	Review	• use checking strategies to decide if answers are reasonable • interpret answers within the context of the problem and consider whether answers are sensible • interpret information presented in charts and diagrams and draw appropriate conclusions		
Using number skills	**Use number facts and relationships**	• count reliably up to 10 objects • read and write numbers to at least 10 • compare and order numbers to at least 10	• count reliably up to 20 objects • read and write numbers to at least 20 • compare and order numbers to at least 20 • use number facts within 10, i.e.: – doubling and halving, *e.g. 4 + 4* – bonds of 10, *e.g. 6 + 4*	• count sets of objects by grouping in 2s, 5s or 10s • read and write numbers to 100 • compare and order 2-digit numbers • use mental recall of number facts to 10 to derive other facts, i.e.: – doubling and halving, *e.g. derive 40 + 40 from knowing 4 + 4* – bonds of 10, *e.g. derive 60 + 40 from knowing 6 + 4* • recall and use 2, 5 and 10 multiplication tables
	Fractions, decimals, percentages and ratio		• find halves in practical situations	• find halves and quarters in practical situations
	Calculate using mental and written methods	• combine two groups of objects to find 'how many altogether?' • take away objects to find 'how many are left?'	• add and subtract numbers involving up to 10 objects • use 'counting on' strategies to add 2 collections, starting with the larger number, *e.g. 8 + 5*	• find small differences within 20 by using 'counting on' strategies • use mental recall of number facts to 10 and place value to add or subtract larger numbers, *e.g. 24 + 4, 30 + 5, 34 +10*
	Estimate and check		• make a sensible estimate of a number of objects that can be checked by counting	• use checking strategies: – repeat addition in a different order – use halving and doubling within 20
	Manage money	• use 1p, 2p, 5p and 10p coins to pay for items	• use different combinations of money to pay for items up to 20p • find totals and give change from 10p	• use different combinations of money to pay for items up to £1 • find totals and give change from multiples of 10p
Using measuring skills	**Length, weight/mass, capacity**	• use direct comparisons with: – length, height and distance, *e.g. longer/shorter than* – weight/mass, *e.g. heavier/lighter than* – capacity, *e.g. holds more/less than*	• use non-standard units to measure: – length, height and distance – weight/mass – capacity	• use standard units to measure: – length, height and distance: metres, half metres or centimetres – weight/mass: kilograms or 10 gram weights – capacity: litres
	Time	• demonstrate a developing sense of how long tasks and everyday events take • use the concept of time in terms of their daily activities	• use standard units of time to read 'o'clock' using both analogue and 12-hour digital clocks • use the concept of time in terms of their daily and weekly activities and the seasons of the year	• read 'half past', 'quarter past' and 'quarter to' on an analogue clock • read hours and minutes on a 12-hour digital clock
	Temperature	• use direct comparisons when describing temperature, *e.g. hot/cold*	• use descriptive words for a range of temperatures, *e.g. cooler/warmer*	• compare daily temperatures using a thermometer (°C)
	Area and volume **Angle and position**	• move in given directions	• make whole turns and half turns	• recognise half and quarter turns, clockwise and anti-clockwise • recognise that a quarter turn is a right angle
Using data skills	**Collect and record data** **Present and analyse data** **Interpret results**	• sort and classify objects using one criterion • record collections using marks, numbers or pictures.	• sort and classify objects using more than one criterion • collect information by voting or sorting and represent it in pictures, objects or drawings • make lists and tables based on data collected.	• gather and record data from: – lists and tables – diagrams – block graphs – pictograms where the symbol represents one unit • extract and interpret information from lists, tables, diagrams and graphs.

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Numeracy

Key Stage 2

Strands	Elements	Year 3	Year 4	Year 5	Year 6
		Learners are able to:	**Learners are able to:**	**Learners are able to:**	**Learners are able to:**
Developing numerical reasoning	**Identify processes and connections**	• transfer mathematical skills to a variety of contexts and everyday situations • identify the appropriate steps and information needed to complete the task or reach a solution • select appropriate mathematics and techniques to use • select and use suitable instruments and units of measurement • choose an appropriate mental or written strategy and know when it is appropriate to use a calculator • estimate and visualise size when measuring and use the correct units			
	Represent and communicate	• explain results and procedures clearly using mathematical language • refine informal methods of recording written calculations, moving to formal methods of calculation when developmentally ready • use appropriate notation, symbols and units of measurement • select and construct appropriate charts, diagrams and graphs with suitable scales			
	Review	• select from an increasing range of checking strategies to decide if answers are reasonable • interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible • draw conclusions from data and recognise that some conclusions may be misleading or uncertain			
Using number skills	**Use number facts and relationships**	• read and write numbers to 1 000 • compare and estimate with numbers up to 100 • use mental strategies to recall number facts within 20 • recall 2, 3, 4, 5 and 10 multiplication tables and use to solve multiplication and division problems • multiply numbers by 10	• read and write numbers to 10 000 • compare and estimate with numbers up to 1 000 • use mental strategies to recall multiplication tables for 2, 3, 4, 5, 6 and 10 and use to solve division problems • multiply and divide numbers by 10 and 100	• read and write numbers to 100 000 • compare numbers with 1 and 2 decimal places • use mental strategies to recall multiplication tables for 2, 3, 4, 5, 6, 8 and 10 and use to solve division problems • multiply and divide numbers and decimals by 10 and 100	• read and write numbers to 1 million and numbers to 3 decimal places • use mental strategies to recall multiplication tables up to 10 x 10 and use to solve division problems • multiply numbers and decimals by a multiple of 10, *e.g. 15 x 30, 1.4cm x 20*
	Fractions, decimals, percentages and ratio	• use halves and quarters • halve 2-digit numbers in the context of number, money and measures • find fractional quantities linked to known multiplication facts, *e.g. $^1/_3$ of 18, $^1/_5$ of 15*	• halve 3-digit numbers in the context of number, money and measures • find fractional quantities using known table facts, *e.g. $^1/_6$ of 30cm* • recognise fractions that are several parts of a whole, *e.g. $^2/_3$, $^3/_{10}$*	• use understanding of simple fraction and decimal equivalences when measuring and calculating, *e.g. ½ = 0.5, $^1/_{10}$ = 0.1* • calculate fractional quantities, *e.g. $^1/_8$ of 24 = 3, so $^5/_8$ of 24 = 15* • use doubling and halving strategies when working with simple proportions	• use understanding of simple fraction, decimal and percentage equivalences, *e.g. find 25% of 60cm and know that this is equivalent to ¼ of 60cm* • calculate percentage quantities based on 10%, *e.g. 20%, 5%, 15%* • use simple ratio and proportion
	Calculate using mental and written methods	• find differences within 100 • use mental strategies to add and subtract 2-digit numbers • use partitioning to double and halve 2-digit numbers	• find differences within 1000 • add a 2-digit number to, and subtract a 2-digit number from, a 3-digit number using an appropriate mental or written method • use mental strategies to multiply and divide 2-digit numbers by a single digit number	• find differences between numbers with 1 decimal place • add and subtract 3-digit numbers using an appropriate mental or written method • multiply and divide 3-digit numbers by a single-digit number	• add and subtract numbers using whole numbers and decimals • multiply 2- and 3-digit numbers by a 2-digit number • divide 3-digit numbers by a 2-digit number
	Estimate and check	• check subtraction using addition • check halving using doubling • check multiplication using repeated addition	• check answers using inverse operations • estimate by rounding to the nearest 10 or 100	• check answers using inverse operations • estimate by rounding to the nearest 10, 100 or 1 000	• check answers using inverse operations • estimate by rounding to the nearest 10, 100, 1000 or whole number
	Manage money	• use different combinations of money to pay for items up to £2 and calculate the change • order and compare items up to £10 • record money spent and saved	• use money to pay for items up to £10 and calculate the change • order and compare items up to £100 • add and subtract totals less than £10 using correct notation, *e.g. £6.85 – £2.76* • manage money, compare costs from different retailers and determine what can be bought within a given budget	• order and compare the cost of items up to £1 000 • add and subtract totals less than £100 using correct notation, *e.g. £28.18 + £33.45* • plan and track money and savings by keeping accurate records • realise that budgeting is important	• use the terms profit and loss in buying and selling activities and make calculations for this • understand the advantages and disadvantages of using bank accounts • make comparisons between prices and understand which is best value for money
Using measuring skills	**Length, weight/mass, capacity**	• recognise that perimeter is the distance around a shape • use standard units of measure: – length: measure on a ruler to the nearest ½ cm – weight/mass: use 5g, 10g and 100g weights – capacity: use litres and half litres; measure to the nearest 100ml	• measure and calculate the perimeter of squares and rectangles • measure on a ruler to the nearest mm and record using a mix of units, *e.g. 1cm 3mm* • use weighing scales with divisions to weigh objects to the nearest 5g, 10g, 25g or 100g • measure capacities to the nearest 50ml or 100ml • convert metric units of length to smaller units, *e.g. cm to mm, m to cm, km to m*	• measure perimeters • use measuring instruments with 10 equal divisions between each major unit, and record using decimal notation, *e.g. 4.2cm, 1.3kg* • make use of conversions, *e.g. ¼ of a km = 250m*	• read and interpret scales or divisions on a range of measuring instruments • record measurements in different ways, *e.g. 1.3kg = 1kg 300g* • use the language of imperial units in daily use, *e.g. miles, pints*
	Time	• tell the time to the nearest 5 minutes on an analogue clock and calculate how long it is to the next hour • read hours and minutes on a 12-hour digital clock using am/pm conventions	• tell the time to the nearest minute on analogue clocks • read hours and minutes on a 24-hour digital clock • time and order events in seconds • use calendars to plan events	• read and use analogue and digital clocks • time events in minutes and seconds, and order the results • carry out practical activities involving timed events and explain which unit of time is the most appropriate	• use and interpret timetables and schedules to plan events and activities and make calculations as part of the planning process • estimate how long a journey takes • time events in minutes and seconds to the nearest tenth of a second
	Temperature	• take temperature readings using thermometers and interpret readings above and below 0°C		• measure and record temperatures involving positive and negative readings • calculate temperature differences, including those involving temperature rise and fall across 0°C	
	Area and volume **Angle and position**	• find areas by counting squares • use the four compass points to describe directions	• recognise volume in practical contexts • use eight compass points to describe direction	• calculate, estimate and compare the area of squares and rectangles using standard units • find volumes by counting and other practical methods • use coordinates to specify location	• calculate the area of squares and rectangles • use grid references to specify location
Using data skills	**Collect and record data** **Present and analyse data** **Interpret results**	• represent data using: – lists, tally charts, tables and diagrams – bar charts and bar line graphs labelled in 2s, 5s and 10s – pictograms where one symbol represents more than one unit using a key – Venn and Carroll diagrams • extract and interpret information from charts, timetables, diagrams and graphs.		• represent data using: – lists, tally charts, tables, diagrams and frequency tables – bar charts, grouped data charts, line graphs and conversion graphs • extract and interpret information from an increasing range of diagrams, timetables and graphs (including pie charts) • use mean, median, mode and range to describe a data set.	

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Numeracy
Key Stage 3

Strands	Elements	Year 7	Year 8	Year 9
		Learners are able to:	**Learners are able to:**	**Learners are able to:**
Developing numerical reasoning	**Identify processes and connections**	• transfer mathematical skills across the curriculum in a variety of contexts and everyday situations • select, trial and evaluate a variety of possible approaches and break complex problems into a series of tasks • prioritise and organise the relevant steps needed to complete the task or reach a solution • choose an appropriate mental or written strategy and know when it is appropriate to use a calculator • use a scientific calculator to carry out calculations effectively and efficiently using the available range of function keys • identify, measure or obtain required information to complete the task • identify what further information might be required and select what information is most appropriate • select appropriate mathematics and techniques to use • estimate and visualise size when measuring and use the correct units		
	Represent and communicate	• explain results and procedures precisely using appropriate mathematical language • refine methods of recording calculations • use appropriate notation, symbols and units of measurement, including compound measures • select and construct appropriate charts, diagrams and graphs with suitable scales • interpret graphs that describe real-life situations, including those used in the media, recognising that some graphs may be misleading		
	Review	• select and apply appropriate checking strategies • interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible • verify and justify results or solutions, including discussion on risk and chance where relevant • interpret mathematical information; draw inferences from graphs, diagrams and data, including discussion on limitations of data • draw conclusions from data and recognise that some conclusions may be misleading or uncertain		
Using number skills	**Use number facts and relationships**	• read and write numbers of any size and use the four operations and the connections between them, *e.g. apply division as the inverse of multiplication* • recognise and apply key mental facts and strategies • use appropriate strategies for multiplication and division, including application of known facts • use the terms square and square root	• recognise and apply key mental facts and strategies • use known facts to derive others, *e.g. use 7 x 6 to derive 0.7 x 6* • use the terms cube, cube root and reciprocal	• use powers and understand the importance of powers of 10 • show awareness of the need for standard form and its representation on a calculator
	Fractions, decimals, percentages and ratio	• use equivalence of fractions, decimals and percentages to compare proportions • recognise that some fractions are recurring decimals, *e.g. $\frac{1}{3}$ is $0.3\dot{3}$* • calculate percentages of quantities using non-calculator methods where appropriate • use ratio and proportion including map scales	• use equivalence of fractions, decimals and percentages to select the most appropriate for a calculation • simplify a calculation by using fractions in their simplest terms • calculate a percentage, fraction, decimal of any quantity with a calculator where appropriate • calculate the outcome of a given percentage increase or decrease • use ratio and proportion to calculate quantities	• use equivalence of fractions, decimals and percentages to select the most appropriate for a calculation • use and interpret different representations of fractions, *e.g. mixed numbers and improper fractions* • express one quantity as a percentage of another • calculate a percentage increase or decrease • use ratio and proportion to calculate quantities
	Calculate using mental and written methods	• use efficient written methods to add and subtract numbers with up to 2 decimal places • multiply and divide 3-digit by 2-digit whole numbers, extending to multiplying and dividing decimals with 1 or 2 places by single-digit whole numbers • multiply and divide whole numbers by 0.5, 0.2, 0.1 • use the order of operations	• use efficient written methods to add and subtract numbers with up to 2 decimal places • use efficient methods for multiplication and division of whole numbers and decimals, including decimals such as 0.6 or 0.06 • use the order of operations including brackets	• use efficient written methods to add and subtract numbers and decimals of any size, including a mixture of large and small numbers with differing numbers of decimal places • multiply and divide whole numbers and decimals • use the order of operations including brackets and powers
	Estimate and check	• use a range of strategies to check calculations including the use of inverse operations, equivalent calculations and the rules of divisibility • use rounding to estimate answers • present answers to a given number of decimal places	• use rounding to estimate answers to a given number of significant figures • present answers to a given number of significant figures	• make and justify estimates and approximations of calculations • choose the appropriate degree of accuracy to present answers
	Manage money	• use profit and loss in buying and selling calculations • understand the advantages and disadvantages of using bank accounts, including bank cards • make informed decisions relating to discounts and special offers	• carry out calculations relating to VAT, saving and borrowing • appreciate the basic principles of budgeting, saving (including understanding compound interest) and borrowing	• calculate using foreign money and exchange rates • understand the risks involved in different ways of saving and investing • describe why insurance is important and understand the impact of not being insured
Using measuring skills	**Length, weight/mass, capacity**	• find perimeters of shapes with straight sides • read and interpret scales on a range of measuring instruments • convert between units of the metric system and carry out calculations	• use the common units of measure, convert between related units of the metric system and carry out calculations • use rough metric equivalents of imperial units in daily use	• find circumferences of circles • make links between speed, distance and time
	Time	• measure and record time in hundredths of a second • use time zones	• interpret fractions of a second appropriately • use timetables and time zones to calculate travel time	
	Temperature	• record temperatures in appropriate temperature scales	• convert temperatures between appropriate temperature scales	• convert temperatures between appropriate temperature scales
	Area and volume **Angle and position**	• use formulae for the area of rectangles and triangles • measure and draw angles	• calculate areas of compound shapes (*e.g. consisting of rectangles and triangles*) and volumes of simple solids (*e.g. cubes and cuboids*) • use compass bearings and grid references to specify locations	• find areas of circles • apply understanding of bearings and scale to interpret maps and plans, and to create plans and drawings to scale
Using data skills	**Collect and record data** **Present and analyse data** **Interpret results**	• collect own data for a survey, *e.g. through designing a questionnaire* • construct frequency tables for sets of data, grouped where appropriate, in equal class intervals (groups given to learners) • construct a wide range of graphs and diagrams to represent the data and reflect the importance of scale • interpret diagrams and graphs (including pie charts) • use mean, median, mode and range to compare two distributions (discrete data).	• plan how to collect data to test hypotheses • construct a wide range of graphs and diagrams to represent discrete and continuous data • construct frequency tables for sets of data in equal class intervals, selecting groups as appropriate • construct graphs to represent data including scatter diagrams to investigate correlation • interpret diagrams and graphs to compare sets of data • use mean, median, mode and range to compare two distributions (continuous data).	• test hypotheses, making decisions about how best to record and analyse the information from large data sets • construct and interpret graphs and diagrams (including pie charts) to represent discrete or continuous data, with the learner choosing an appropriate scale • select and justify statistics most appropriate to the problem considering extreme values (outliers) • examine results critically, select and justify choice of statistics recognising the limitations of any assumptions and their effect on the conclusions drawn • use appropriate mathematical instruments and methods to construct accurate drawings.

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Numeracy
More able and talented

Strands	Elements	Extension Learners are able to:
Developing numerical reasoning	**Identify processes and connections**	• transfer mathematical skills across the curriculum in a variety of contexts and everyday situations • select, trial and evaluate a variety of possible approaches and break complex problems into a series of tasks • prioritise and organise the relevant steps needed to complete the task or reach a solution • choose an appropriate mental or written strategy and know when it is appropriate to use a calculator • use a scientific calculator to carry out calculations effectively and efficiently using the available range of function keys • identify, measure or obtain required information to complete the task • identify what further information might be required and select what information is most appropriate • select appropriate mathematics and techniques to use • estimate and visualise size when measuring and use the correct units
	Represent and communicate	• explain results and procedures precisely using appropriate mathematical language • refine methods of recording calculations • use appropriate notation, symbols and units of measurement, including compound measures • select and construct appropriate charts, diagrams and graphs with suitable scales • interpret graphs that describe real-life situations, including those used in the media, recognising that some graphs may be misleading
	Review	• select and apply appropriate checking strategies • interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible • verify and justify results or solutions, including discussion on risk and chance where relevant • interpret mathematical information; draw inferences from graphs, diagrams and data, including discussion on limitations of data • draw conclusions from data and recognise that some conclusions may be misleading or uncertain
Using number skills	**Use number facts and relationships**	• use and interpret numbers in standard form within calculations
	Fractions, decimals, percentages and ratio	• use and understand the idea of reverse percentage to find an original quantity • use multipliers as an efficient method when working with percentages, *e.g. multiply by 1.2 to increase an amount by 20%* • use and understand ratio and proportion in 2 dimensions
	Calculate using mental and written methods	
	Estimate and check	• recognise and define limitations on accuracy of measurements
	Manage money	• use and understand efficient methods of calculating compound interest • understand and demonstrate the real-life process of foreign exchange • understand and calculate income tax
Using measuring skills	**Length, weight/mass, capacity**	• understand and use a variety of compound measures
	Time	
	Temperature	
	Area and volume **Angle and position**	• apply proportional change to 2-dimensional designs
Using data skills	**Collect and record data** **Present and analyse data** **Interpret results**	• understand slopes and gradients of graphs and relate to compound measures.

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