Mathematics Curriculum Overview Davyhulme Primary School

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Place value (within 10) Addition and subtraction (within 10)	Addition and subtraction (within 10) Geometry: Shape (recognise and sort 2D and 3D shapes) Place Value (within 20)	Addition and subtraction (within 20) Place value (within 50)	Place value (within 50) Measurement: length and height (using non-standard measures) Measurement: weight and volume (using non-standard measures)	Multiplication and division (groups, sharing and doubling) Fractions (halves and quarters)	Geometry: Position and direction (full, half and quarter turns) Place value (within 100) Measurement: money (recognising coins and notes, counting in coins) Measurement: Time (dates and times to the o'clock and half hour)
Year 2	Place value (within 100)	Addition and subtraction (up	Multiplication and division (2,	Geometry: properties of shapes	Measurement: length and height (cm and m)	Measurement: Time (quarter past, half past, to

	Addition and subtraction (up to 3 digit numbers)	to 3 digit numbers) Measurement: money (count, compare, find totals and differences, two step problems) Multiplication and division (making equal groups and using arrays)	5 and 10 times tables) Statistics: tally charts, pictograms and black charts	(properties of 2D and 3D shapes, making patterns and symmetry) Fractions (halves, thirds and quarters)	Geometry: position and direction (describing movements and turns, making patterns)	the nearest 5 minutes) Measurement: mass, capacity and temperature (standard units of measure)
Year 3	Place value (up to 1000) Addition and subtraction (up to 3 digits, crossing ten)	Addition and subtraction (up to 3 digits, crossing ten) Multiplication and division (2,5,10 and 3 times tables)	Multiplication and division (related calculations, dividing 2 digits by 1 digit, scaling) Measurement: money (converting pounds and	Measurement: length and perimeter (m, cm and mm, comparing, adding and subtracting lengths, perimeter) Fractions (halves, thirds,	Fractions (equivalent, adding and subtracting, comparing and ordering) Measurement: Time (to the nearest 5 minutes and 1 minute, a.m. and p.m., the 24	Geometry: properties of shape (angles, horizontal, vertical and perpendicular lines, recognising and describing 2D and 3D shapes, making 3D shapes)

			pence, adding and subtracting, giving change) Statistics (making pictograms, tally charts, bar charts and tables)	quarters, unit and non-unit fractions, equivalence and counting)	hour clock, durations of time, measuring in seconds)	Measurement: mass and capacity (measuring, comparing and adding and subtracting)
Year 4	Place value (rounding to nearest 10 or 100, counting in 1000s, partitioning, up to 1000 more or less, number line to 10,000) Addition and subtraction (up to 4 digit numbers, efficient	Addition and subtraction (up to 4 digit numbers, efficient methods and estimating) Measurement: length and perimeter (equivalent lengths, kms, measuring perimeter)	Multiplication and division (11 and 12 times tables, factor pairs, efficient multiplication, written methods, multiplying and dividing 2 digit by 1 digit numbers) Measurement: Area (counting	Fractions (tenths, equivalent fractions, fractions greater than 1, counting in fractions, adding fractions) Decimals (tenths and hundredths, dividing 1 or 2	Decimals (making a whole, rounding, comparing and ordering decimals) Measurement: money (pounds and pence, ordering and estimating money, four operations) Measurement: time (hours,	Statistics (interpret charts, comparison, sum and difference, line graphs) Geometry: property of shape (comparing and ordering angles, triangles, quadrilaterals, lines of symmetry)

	methods and estimating)	Multiplication and division (multiplying and dividing by 1, itself, 10 and 100, 3,6,7 and 9 times tables)	squares, making shapes, comparing area)	digit numbers by 10 and 100)	minutes and seconds, years, months, weeks and days, analogue to digital – 12 and 24 hour clock)	Geometry: position and direction (describe position, draw and move on a grid)
Year 5	Place value (comparing, rounding and ordering numbers to 100,000, numbers to a million, negative numbers, Roman numerals to 1,000)

Addition and subtraction (adding and subtracting 4 digit numbers, rounding to estimate and | Multiplication and division (multiples and factors, prime, square and cube numbers, multiplying and dividing by 10,100 and 1000)

Measurement: perimeter and area (measuring and calculating perimeter, areas of rectangles, compound and irregular shapes) | Multiplication and division (multiplying and dividing 2,3 and 4 digits by 1 and 2 digits, divide with remainders)

Fractions (equivalent fractions, fractions greater than 1, improper and mixed fractions, comparing, | Fractions (equivalent fractions, fractions greater than 1, improper and mixed fractions, comparing, ordering, adding and subtracting fractions, adding 3 or more fractions)

Decimals and percentages (decimals up to | Decimals (adding and subtracting decimals to 1, complements to 1, adding and subtracting decimals with the same and different numbers of decimal places, decimal sequences, multiplying and dividing by 10,100 and 1000)

Geometry: properties of | Geometry: position and direction (position in the first quadrant, reflection with co-ordinates, translation with co-ordinates)

Measurement: converting units (kg,km,mg,ml, metric and imperial units, converting units of time, timetables) |

	approximate, inverse operations and multistep problems) Statistics (interpreting charts, comparison, sum and difference, line graphs, reading and interpreting tables including two way tables, timetables)		ordering, adding and subtracting fractions, adding 3 or more fractions)	2 places, decimals as fractions, understanding thousandths, rounding, ordering and comparing decimals, understanding percentages, equivalent F.D.P)	shape (measuring angles accurately, calculating angles, regular and irregular polygons, reasoning about 3D shapes)	Measurement: volume (compare and estimate volume, estimate capacity)
Year 6	Place value (numbers to ten million, compare and order any number, round any number, negative numbers)	Multiplication and division (multiply and divide up to 4 digits, divide with remainders, short division, division using factors)	Decimals (up to 3 decimal places, multipliy by 10,100 and 1000, multiply and divide by integers, decimals to	Measurement: Perimeter, area and volume (area of a triangle, area of a parallelogram, volume of a cuboid)	Geometry: properties of shape (angles, draw shapes accurately, draw nets of 3D shapes) Consolidation	Consolidation, investigations and preparation for Key Stage 3.

| | Addition and subtraction (adding and subtracting with more than 4 digits, inverse operations and multistep problems) | Fractions (equivalent fractions, simplify fractions, improper and mixed fractions, comparing, ordering, adding and subtracting)

Geometry: position and direction (four quadrants, translations and reflections) | fractions and vice versa)

Percentages (fractions to percentages, equivalent F.D.P. , percentages of amounts and missing values)

Algebra (finding a rule, expressions, substitution and formulae, forming equations, solving two step equations, pairs of values, enumerate possibilities) | Ratio (ratio language and symbol, ratio and fractions, calculating ratio, scale factors, ratio and proportion problems)

Statistics (line graphs, circles, pie charts, the mean) | | |

			Measurement: converting units (metric and imperial measures)			

National Curriculum for Maths

Year 1 Maths Objectives

Place Value

COUNTING	EARLY COUNTING OBJECTIVES FOR ASSESSMENT: Count reliably up to 20 objects. Move to 20 when confident. Count on in ones from any small number. Read and write numerals to at least 20 in order. 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 twos, threes, fives and tens given a number, identify one more and one less
COMPARING NUMBERS	use the language of: equal to, more than, less than (fewer), most, least Begin to recognise odd and even numbers to 20. Compare two familiar numbers, say which is more or less, and give a number that lies between them.

	Order numbers to at least 20 and position them on a number track.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	identify and represent numbers using objects and pictorial representations including the number line Understand the vocabulary of estimation and give a sensible estimate of up to 30 objects. Recognise and predict from simple patterns and relationships.
READING & WRITING NUMBERS	read and write numbers from 1 to 20 in numerals and words.
UNDERSTANDING PLACE VALUE	start to recognise the place value of each digit in a two-digit number (tens, ones) Partition a 'teens' number into tens and ones. Say the number that is 10 more than any given number to 20.
PROBLEM SOLVING	begin to use place value and number facts to solve problems Solve mathematical problems or puzzles. Suggest extensions 'What if?' 'What could I try next?' REASONING: Investigate a general statement about familiar numbers by finding examples that satisfy it. Explain methods and reasoning orally.

Addition & Subtraction

NUMBER BONDS	represent and use number bonds and related subtraction facts within 20 Recall addition doubles up to 5 + 5. Recall addition and subtraction facts up to 5. Recall pairs of numbers which total 10. Identify near doubles using doubles already known.
MENTAL CALCULATION	add and subtract one-digit and two-digit numbers to 20, including zero Use number facts to add/subtract pair of numbers within range 0 to 20. Understand the operation of subtraction (as take away).

	Find simple 'differences'. Add more than two numbers. Put the largest number first. Count on in ones, including beyond 10, e.g. 7 + 5. Partition into 5 and a bit when adding 6, 7, 8, or 9. Add 9 to a single–digit number by adding 10 then subtracting 1. Bridge through 10 when adding single-digit numbers. Bridge through 20 when adding a single digit number. read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (known as a number sentence) (appears also in Written Methods) Use +, – and = signs to record mental calculations in a number sentence. Understand the operation of addition (as *how many more*) and of subtraction (as difference) and use the related vocabulary.
WRITTEN METHODS	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) Understand the operation of addition; recognise that addition can be done in any order. Use patterns of similar calculations.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	Begin to recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
PROBLEM SOLVING	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9 Choose and use the appropriate number operation (counting, add, subtract) and mental strategies to solve simple money or 'real life' problems using counting, addition or subtraction, halving or doubling.

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	*count in multiples of twos, fives and tens* (copied from Number and Place Value)
WRITTEN CALCULATION	Begin to calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×)and equals (=) signs
PROBLEM SOLVING	solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Algebra

EQUATIONS	*solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and **missing number problems** such as* *7 = □ - 9* (copied from Addition and Subtraction) Recognise and use □ or △ to stand for an unknown number. *represent and use number bonds and related subtraction facts within 20* (copied from Addition and Subtraction)
SEQUENCES	*sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening* (copied from Measurement) Recognise and extend number sequences with differences of 1, 2 or 3.

Fractions (including decimals & percentages)

RECOGNISING FRACTIONS	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

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	describe position, direction and movement, including half, quarter and three-quarter turns. Talk about things that turn. Use everyday language to describe position, direction and movement.
PATTERN	Begin to order and arrange combinations of mathematical objects in patterns Make and describe models, patterns and pictures using construction kits. Recognise simple patterns. Use one or more shapes to make patterns, describe repeating patterns. Predict from simple patterns, and suggest extensions.

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres]. Use everyday language to describe features of familiar 2–D and 3–D shapes, referring to shapes with flat faces, number of faces or corners, number of sides. Begin to relate solid shapes to pictures of them.
DRAWING & CONSTRUCTING	Draw common 2-D shapes Use one or more shapes to make repeating patterns. Make and describe models, patterns and pictures using everyday materials, plasticine. Fold shapes in half, then make them into symmetrical patterns.
COMPARING & CLASSIFYING	compare and sort common 2-D shapes Investigate general statements about shapes.
ANGLES	describe position, direction and movement, including whole, half, quarter and three-quarter turns

Measurement

COMPARING & ESTIMATING	Understand and use the vocabulary related to length and time. compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] time [e.g. quicker, slower, earlier, later] sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] order familiar events
MEASURING & CALCULATING	measure and begin to record the following: * **lengths and heights** Compare two, then more, lengths using direct comparison. Measure lengths using uniform non-–standard units or standard units, e.g. metre sticks. Suggest suitable (non) standard units and measuring equipment to estimate, then measure a length, recording estimates and measurements as '3 and a bit'. * **mass/weight** Understand and use the vocabulary related to mass. Compare two, then more, masses using direct comparison. Measure mass using uniform non-–standard units. Suggest suitable (non) standard units and measuring equipment to estimate, then measure, mass recording estimates and measurement as 'about as heavy as 20 cubes'. * **capacity and volume** Understand and use the vocabulary related to capacity. Compare two, then more, capacities using direct comparisons. Measure capacity using uniform non-standard units or standard units (litre). Suggest suitable uniform non-standard then standard units and measuring equipment to estimate, then measure capacity recording estimates and measurements as 'about 3 beakers full' or 'just under 5 litres'. * **time** (hours, minutes, seconds**)**

	Solve simple problems involving length, mass, capacity or time. recognise and know the value of different denominations of coins and notes Find totals, give change. Must: Recognise 1p and 2p coins. Find totals up to 10p. Should: Recognise 1p, 2p, 5p and 10p coins and equivalent values. Find totals. Could: Recognise coins of different values up to 20p. Find totals, give change from up to 20p and work out how to pay using smaller coins. Work out how to pay an amount by using smaller coins. Solve simple mathematical money problems or puzzles. Explain methods orally.
TELLING THE TIME	tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. On analogue clock. recognise and use language relating to dates, including days of the week, weeks, months and years Know the seasons of the year

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	Solve a problem by sorting information using objects or pictures. Discuss and explain results.
SOLVING PROBLEMS	Solve a problem by sorting classifying and organising information in a list or simple table. Solve a problem by sorting information using objects or pictures. Discuss & explain results.

Year 2 Maths Objectives

Place Value

COUNTING	count in steps of 1, 2, 3, and 5 from 0, and in tens from any two-digit number, forward or backward
	Say the number names to at least 100, from and back to zero. Count reliably up to 100 objects by grouping them in 10s. Count up to 100 objects by grouping in tens, then fives or twos. Count in 100s from/back to 0. Count on in steps of 5 to at least 30, from 0 or a small number. Count on in steps of 3 or 4 to at least 30, from and back to zero.
COMPARING NUMBERS	compare and order numbers from 0 up to 100; use <, > and = signs Order whole numbers and place them on a number line or 100-square. Recognise two–digit multiples of 10. Recognise two–digit multiples of 5. Compare two two–digit numbers, say which is more or less and give a number that lies between them.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	identify, represent and estimate numbers using different representations, including the number line Place numbers on number line or 100 square Recognise odd, even numbers, and two–digit multiples of 2, to 30. Use and read vocabulary of estimation and approximation. Give a sensible estimate of up to 50 objects.
READING & WRITING NUMBERS	Read and write numbers in figures and words to at least 50. read and write numbers to at least 100 in numerals and in words
UNDERSTANDING PLACE VALUE	recognise the place value of each digit in a two-digit number (tens, ones) Know what each digit in a two-digit number represents including 0 as place holder. Say the number that is one or ten more/less than a given two-digit number. Partition two-digit numbers into a multiple of 10 and ones.
ROUNDING	Round any number to the nearest 10 Round numbers less than 100 to the nearest 10.
PROBLEM SOLVING	use place value and number facts to solve problems Solve mathematical problems/puzzles, recognise simple patterns and relationships and make predictions. Suggest extensions. REASONING: Give examples to match general statement about numbers.

Addition & Subtraction

NUMBER BONDS	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
	Recall addition and subtraction facts for each number up to 10.
	State subtraction fact corresponding to addition fact and vice versa.
	Recall doubles to 10 + 10 and corresponding halves.
	Derive doubles to 15 + 15 and corresponding halves.
	Derive doubles of multiples of 5, halves of multiples of 10.
	Recall addition and subtraction facts for each number up to 10.
	Recall all pairs that make 20 (e.g. 13 + 7, 20 - 12).
	Recall pairs of multiples of 10 that make 100.
MENTAL CALCULATION	add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
	* a two-digit number and ones
	* a two-digit number and tens
	Say the number that is one or ten more/less than a 2-digit number
	* two two-digit numbers
	adding three one-digit numbers
	Use number facts and place value to add/subtract mentally.
	Understand the operations of addition and subtraction and use and begin to read the related vocabulary.
	Use patterns of similar calculations.
	Find small difference, counting up.
	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
	Add more than two numbers, e.g. add three small numbers by putting the largest first and /or finding a pair that make 10.
	Put the larger number first.

	Add/subtract 9 or 11 by adding/subtracting 10 and adjusting by 1. Add /subtract 9, 19, 11, 21. Identify near doubles, using doubles already known. Partition into 5 and a bit when adding 6, 7, 8, or 9. Bridge through 10, then 20, and adjust. Add two then three two-digit numbers with apparatus. State subtraction fact corresponding to addition fact and vice versa.
WRITTEN METHODS	Inverse operations for checking Use + − = signs to record mental calculations in a number sentence Add and subtract numbers with up to two digits, using a numberline
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. Check sums by adding in a different order.
PROBLEM SOLVING	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods *solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change* (copied from Measurement) Explain how problem was solved, orally and in writing.

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	*count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value) recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

	Understand the term 'multiple' Understand multiplication as repeated addition. Use the related vocabulary. Use known facts to carry out simple multiplication. Add and multiply mentally to solve simple word problems. Know and use halving as the inverse of doubling. Understand division as grouping or sharing. Read the related vocabulary.
MENTAL CALCULATION	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Use known number facts and place value to divide mentally.
WRITTEN CALCULATION	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
PROBLEM SOLVING	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts Choose and use appropriate operations and calculation strategies to solve one and two step word problems (incl. money) using + and −, and one step problems using x and ÷.

Algebra

EQUATIONS	*recognise and use the inverse relationship between addition and subtraction and use this to check calculations and **missing number** problems.* (copied from Addition and Subtraction) *recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100* (copied from Addition and Subtraction) Use x and = signs, and □ to stand for unknown number. Use * or * to stand for an unknown number.
SEQUENCES	*compare and sequence intervals of time* (copied from Measurement)

	Describe and extend number sequences.
	order and arrange combinations of mathematical objects in patterns (copied from Geometry: position and direction)

Fractions (including decimals & percentages)

COUNTING IN FRACTIONAL STEPS	*Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)*
RECOGNISING FRACTIONS	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity MUST: Begin to recognise and find one half of shapes and small numbers of objects. SHOULD: Begin to recognise and find one quarter of shapes and small numbers of objects.
EQUIVALENCE	write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. MUST: Recognise that two halves make one whole. SHOULD: Recognise that four quarters make one whole. COULD: Begin to recognise that two quarters and one half are equivalent

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) Give instructions to move along a route. Visualise objects in given positions. Use N, S, E, W to track a pathway or route (mapwork)
PATTERN	order and arrange combinations of mathematical objects in patterns and sequences

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	Use mathematical names for common 3-D and 2-D shapes. Sort shapes and describe some of their features, e.g. number of sides, corners, edges, faces.
	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
	identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
	identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
DRAWING & CONSTRUCTING	draw 2-D shapes and begin to make 3-D shapes using modelling materials; Make and describe shapes, patterns or pictures using solid shapes and templates. Make and describe shapes using pin-boards, elastic boards, squared paper, and programmable toy. Begin to recognise line symmetry.
COMPARING & CLASSIFYING	compare and sort common 2-D and 3-D shapes and everyday objects Investigate general statements about shapes. Solve shape puzzles, explaining reasoning orally.
ANGLES	describe position, direction and movement, including whole, half, quarter and three-quarter turns clockwise and anti-clockwise Recognise right angles.

Measurement

COMPARING & ESTIMATING	compare and order lengths, mass, volume/capacity and record the results using >, < and =
	compare and sequence intervals of time
MEASURING & CALCULATING	Use and begin to read the vocabulary related to length, mass, capacity and time.
	choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm); Estimate, measure then compare lengths using metres, recording as '3 and a bit metres'. Suggest suitable units and equipment.

	Use a ruler to measure and draw lines to the nearest cm.
	mass (kg/g); Estimate, measure then compare masses using kilograms; suggest suitable units and equipment for such measurements. Read a simple scale. Record measurements as 'nearly 3 kilograms heavy'. **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels Estimate, measure then compare capacities using litres. Suggest suitable units and equipment for such measurements. Read a scale to the nearest division. Solve problems involving length, mass, capacity or time. 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 Recognise all coins. Find totals. Give change. Work out how to pay. Use £p notation. Choose and use appropriate number operation and calculation strategy to solve simple word problems. Must: one step. Should: two step. Explain method. Check results. **solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change
TELLING THE TIME	Use units of time: second, minute, hour, day, week. Know relationships between second, minute, hour, day, week. Order months of the year. Suggest suitable units to estimate or measure time.

	tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.
	Tell the time to half past, 15 minutes past, 45 minutes past and begin to count in minutes of intervals of 5
	Start to look at digital time and link to analogue time
	MUST: Read time to hour on analogue or 12-hour digital clock.
	SHOULD: Read time to half hour on analogue / 12 hour digital clocks.
	COULD: Read time to half and quarter hour on analogue and 12-hour digital clocks.
	Solve time problems
	know the number of minutes in an hour and the number of hours in a day.
	(appears also in Converting)
CONVERTING	know the number of minutes in an hour and the number of hours in a day.
	(appears also in Telling the Time)

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and construct simple pictograms, tally charts, block diagrams and simple tables
	ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
	ask and answer questions about totalling and comparing categorical data
SOLVING PROBLEMS	Solve one-step problems using information presented in bar charts, pictograms and tables eg. 'How many more children liked chocolate than vanilla?'
	Solve a problem by sorting, classifying and organising information in a list or simple table, pictogram or block graph. Discuss and explain results.

Year 3 Maths Objectives

Place Value

COUNTING	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number Count on/back in 10s, 100s from any two and three-digit number. Count larger collections by grouping them in tens, then other numbers. Recognise two-digit and three-digit multiples of 2, 5, and 10 and three-digit multiples of 50 and 100.
COMPARING NUMBERS	compare and order numbers up to 1000 and position them on a number line. Order a set of three-digit numbers, saying which one is more or less, and give a number which lies between them. Read and write the vocabulary of comparing and ordering numbers, including ordinal numbers to 100. Recognise odd/even numbers to 100.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	identify, represent and estimate numbers using different representations Read and begin to write the vocabulary of estimation and approximation. Estimate up to 100 objects.
READING & WRITING NUMBERS	read and write numbers up to 1000 in numerals and in words *tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks* (copied from Measurement)
UNDERSTANDING PLACE VALUE	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
ROUNDING	Round any two – digit number to the nearest 10 or 100 Round any three-digit number to the nearest 100.
PROBLEM SOLVING	solve number problems and practical problems involving these ideas. Solve number puzzles. Explain methods and reasoning orally and in writing. Investigate general statements about familiar numbers, and give examples that match them.

Addition & Subtraction

NUMBER BONDS	Recall addition, subtraction facts for each number up to at least 20.

	Recall pairs that make 20. Recall pairs of multiples of 100 that make 1000. Recall pairs of multiples of 5 with a total of 100. Revision: bonds to 20. Within 1000, subtract any multiple of 100

MENTAL CALCULATION	add and subtract numbers mentally, including:
	  * a three-digit number and ones
	  * a three-digit number and tens
	  * a three-digit number and hundreds
	  * adding three two-digit numbers
	Partition into tens and units and recombine.
	Round up or down and adjust:
	127 + 49 (127 + 50 – 1)
	Or
	139 + 45 (140 + 45 – 1)
	Add or subtract a near multiple of 10 to a two-digit number, by adding or subtracting the nearest multiple of 10, and adjusting.
	
	Add/subtract 1, 10, 100 to any whole number.
	Add/subtract 9, 19, 29… and 11, 21, 31…
	Recognise that addition can be done in any order.
	Put larger number first in order to count on.
	Identify near doubles.
	Bridge through a multiple of 10 and adjust.
	Add three then four single–digit numbers mentally.
	Add three or four small numbers by putting the largest number first and/or finding pairs that total 10.
	Partition into 5 and a bit to add 6, 7 or 8.
	
	Understand that subtraction is the inverse of addition.
	Say a subtraction statement equivalent to an addition statement and vice versa.
	Find a small difference by counting up from the smaller number.

WRITTEN METHODS	add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction Use partitioning and numberline as back ups

	Use informal pencil and paper methods to support, record or explain TU + TU, HTU + TU and HTU + HTU. Use informal pencil and paper methods to support, record or explain TU – TU and HTU – TU.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	estimate the answer to a calculation and use inverse operations to check answers Check sums by adding in different order. Check subtraction with addition.
PROBLEM SOLVING	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction Choose appropriate number operations and calculation methods to solve word problems with one or more steps. Explain and record methods informally.

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	*count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value) Recall multiplication facts up to 5 x 5. Recall multiplication facts in x10 table and derive division facts. Recall multiplication facts in x2 table and derive division facts. recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables Derive doubles of whole numbers to 15, corresponding halves. Derive doubles of whole numbers to 20, corresponding halves. Derive doubles of multiples of 5 to 50. Derive doubles of multiples of 50 to 500. Derive near doubles. Understand multiplication as repeated addition and as an array. Read and begin to write related vocabulary. Recognise that multiplication can be done in any order. To multiply by 10/100, shift the digits one / two places to the left.

	Begin to find remainders after division. Round up or down after division.
MENTAL CALCULATION	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods) Understand division as grouping or sharing. Read and begin to write the related vocabulary. Recognise division is inverse of multiplication.
WRITTEN CALCULATION	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods) Say or write division statement corresponding to multiplication statement.
PROBLEM SOLVING	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
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	*estimate the answer to a calculation and use inverse operations to check answers* (copied from Addition and Subtraction) Check multiplication in a different order.

Algebra

EQUATIONS	solve problems, *including **missing number** problems, using number facts, place value, and more complex addition and subtraction.* (copied from Addition and Subtraction) *solve problems, including **missing number** problems, involving multiplication and division, including integer scaling* (copied from Multiplication and Division)
FORMULAE	Use formulae to find perimeter.
SEQUENCES	Completing number and shape patterns. Create and describe simple number sequences. Finding all the possible sequences.

	e.g: RTR, TRR...

Fractions (including decimals & percentages)

COUNTING IN FRACTIONAL STEPS	count up and down in tenths
RECOGNISING FRACTIONS	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators Recognise unit fractions $^1/_2$, $^1/_3$, $^1/_4$, $^1/_5$, $^1/_{10}$, and use them to find fractions of shapes and numbers. Begin to recognise fractions that are several parts of a whole $^2/_3$, $^3/_4$, $^3/_{10}$. Know that 1/2 lies between 1/4 and 3/4. Estimate a simple fraction (proportion) of a shape.
COMPARING FRACTIONS	compare and order unit fractions, and fractions with the same denominators Compare two familiar fractions.
COMPARING DECIMALS	Ordering decimals
ROUNDING INCLUDING DECIMALS	Rounding whole numbers to the nearest 10, 100, 1000 Rounding decimals to the nearest 1 decimal place.
EQUIVALENCE	recognise and show, using diagrams, equivalent fractions with small denominators Begin to recognise simple equivalent fractions, e.g. 5/10 is equivalent to 1/2, 5/5 to 1 whole.
ADDITION & SUBTRACTION OF FRACTIONS	add and subtract fractions with the same denominator within one whole (e.g. $^5/_7 + ^1/_7 = ^6/_7$)
PROBLEM SOLVING	solve problems that involve all of the above

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). Begin to talk about degrees and relate them to above angles.

	Use N, S, E, W to track and create a pathway or route (mapwork)
PATTERN	Make and describe shapes and patterns.
	Solve shape problems or puzzles. Explain reasoning and methods.

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	Classify and describe 3-D and 2-D shapes, referring to reflective symmetry, faces, sides/edges, vertices, angles.
	Identify and sketch lines of symmetry, recognise shapes with no line of symmetry.
	Sketch reflection of simple shape in a mirror.
	Relate solid shapes to pictures of them.
DRAWING & CONSTRUCTING	draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
COMPARING & CLASSIFYING	compare and sort common 2-D and 3-D shapes and everyday objects.
	Use data handling to compare and sort shapes (a Venn diagram or Carroll Diagram).
	Investigate general statements about shapes, and suggest examples to match them. Explain reasoning.
ANGLES	recognise angles as a property of shape or a description of a turn
	Identify right angles in 2-D shapes and in the environment.
	identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
	Recognise that a straight line is two right angles.
	Compare angles with a right angle, saying whether they are more or less.
	identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Measurement

COMPARING & ESTIMATING	compare durations of events, for example to calculate the time taken by particular events or tasks

	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)
MEASURING & CALCULATING	measure, compare, add and subtract: **lengths** (m/cm/mm); Use ruler to draw and measure lines to nearest half cm. Read and begin to write the vocabulary related to length. Choose an appropriate number operation and calculation method to solve word problems. Explain and record method informally. Measure and compare using m, cm. Know relationship m, cm; km, m. Use decimal notation for m and cm. Suggest suitable units and equipment to estimate or measure lengths, including km. Read scales and dials. Identify unlabelled divisions on a number line or measuring scale. Record to nearest whole / half unit, or as mixed units (e.g. 3 m 20 cm). **mass** (kg/g); Read and begin to write the vocabulary related to mass. Measure and compare using kilograms and grams, and know the relationship between them. Suggest suitable units and equipment to estimate or measure mass. Read scales. Record measurements using mixed units, or to the nearest whole/half unit (e.g. 3.5 kg). **volume/capacity** (l/ml) Read scales to the nearest division. Read and begin to write the vocabulary related to capacity. Measure and compare using litres and millilitres, and know the relationship between them. Suggest suitable units and equipment to estimate or measure capacity. Read scales. Record measurements using mixed units, or to the nearest whole/half unit (e.g. 3.5 litres). Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps. Explain and record method. measure the **perimeter** of simple 2-D shapes

	add and subtract amounts of **money** to give change, using both £ and p in practical contexts
	Recognise all coins and notes.
	Find totals, give change and work out how to pay.
	Solve problems involving money.
TELLING THE TIME	tell and write the time from an analogue clock, including using Roman numerals 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, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight
	(appears also in Comparing and Estimating)
	Read time to 5 minutes on analogue and 12-hour digital clocks (e.g. 9:40).
	Read and begin to write the vocabulary related to and time.
	Use a calendar. Choose appropriate number operations and calculation methods to solve time word problems with one or two steps.
	Explain and record method. Check results.
CONVERTING	know the number of seconds in a minute and the number of days in each month, year and leap year
	Use units of time and relationship between them.

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and present data using bar charts, pictograms and tables
	Solve a given problem by organising and interpreting data in bar charts – intervals labelled in ones then twos.
SOLVING PROBLEMS	solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.
	Solve a given problem by organising and interpreting data in frequency tables, and in pictograms with the symbol representing two units.
	Solve a given problem by organising and interpreting data in Venn and Carroll diagrams – one criterion.

Year 4 Maths Objectives

Place Value

COUNTING	count backwards through zero to include negative numbers count in multiples of 6, 7, 9, 25 and 1000 Count on or back in 10s, 100s from any 2- or 3-digit number. Count on or back in repeated steps of 1, 100, 1000. Count up through next multiple of 10, 100, 1000. find 1000 more or less than a given number
COMPARING NUMBERS	order and compare numbers beyond 1000 Order a set of whole numbers up to 10 000. *compare numbers with the same number of decimal places up to two decimal places* (copied from Fractions) Recognise odd and even numbers up to 1000 and some of their properties, e.g. sums, differences of pairs of odd/even numbers. Read and write the vocabulary of comparing and ordering numbers. Use symbols = < > correctly. Give a number lying between two others. Recognise negative numbers in context: number line, thermometer.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	identify, represent and estimate numbers using different representations Read and write the vocabulary of estimation and approximation. Estimate up to 250 objects. Estimate a proportion (fraction).
READING & WRITING NUMBERS	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. Read and write whole numbers up to 10 000, in figures and in words.
UNDERSTANDING PLACE VALUE	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) *find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths* (copied from Fractions)
ROUNDING	round any number to the nearest 10, 100 or 1 000 Round any three-digit number to the nearest 10 or 100. Round any positive number less than 1000 to nearest 10. *round decimals with one decimal place to the nearest whole number* (copied from Fractions)

PROBLEM SOLVING	solve number and practical problems that involve all of the above and with increasingly large positive numbers
	Investigate general statements about familiar numbers.
	Solve number problems and puzzles.
	Explain methods and reasoning orally and in writing.

Addition & Subtraction

NUMBER BONDS	Add strings of 4 numbers. Within 1000, addition of multiples of 10 and 100.
	Recall addition and subtraction facts for each number up to 20.
	Derive addition pairs that total 100, multiples of 50 that total 1000.
MENTAL CALCULATION	Add and subtract numbers mentally, including:
	- a four-digit number and ones
	- a four-digit number and tens
	- a four-digit number and hundreds
	adding four 3-digit numbers
	Add/subtract 1, 10, 100 to any whole number.
	Add/subtract 10, 100 1000 from any two-/three-digit number.
	Add/subtract a pair of two-digit numbers (not crossing 10 or 100 boundary)
	Add several small numbers by finding pairs that total 10, or 9 or 11.
	Partition into tens and units, adding tens first.
	Add three 2-digit multiples of 10
	Add more than two whole numbers less than 1000, and money.
	Use number facts and place value to add/subtract mentally any pair of two-digit whole numbers.
	Understand commutative law of addition.
	Understand principle (not name) of commutative law for + not –.
	Round up or down and adjust:
	2999 + 1999 (3000 + 2000 – 2)
	Find a small difference by counting up.

WRITTEN METHODS	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Use informal pencil and paper methods to support, record or explain addition and subtraction. Develop written methods for + and – of whole numbers less than 1000. Develop/refine written methods for addition/subtraction, include money. Develop, refine written methods for column addition/subtraction. Write subtraction fact corresponding to given addition fact.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	estimate and use inverse operations to check answers to a calculation Explain and record methods. Check with addition in a different order. Check with equivalent calculation. Check using knowledge of sums of odd/even numbers.
PROBLEM SOLVING	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	*count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value) recall multiplication and division facts for multiplication tables up to 12 × 12 Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts. Use closely related facts, e.g. derive x9 or x11 from x10, or derive x6 from x4 plus x2. Partition and multiply. Multiply by partitioning, e.g. 23 x 4.
MENTAL CALCULATION	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 Derive doubles of whole numbers to 50, corresponding halves. Derive doubles of multiples of 10 to 500, corresponding halves. Derive doubles of multiples of 100 to 5000, corresponding halves. Identify near doubles. Multiply a two-digit number by 10. Multiply and divide whole numbers by 10.

	Multiply or divide whole numbers by 10 or 100. Multiply TU by U, e.g. 13 x 3. Multiply and divide an integer up to 1000 by 10; understand the effect. Understand commutative and associative laws of multiplication. Divide a whole number of £ by 2, 4 , 5 or 10 to give £p. Understand distributive law. Round up or down after division. recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) Use doubling and halving of two-digit numbers, e.g. x4 = double double, x5 = x10 halve, x20 = x10 double, x8 = x4 double, 1/4 = half of one 1/2.
WRITTEN CALCULATION	multiply two-digit and three-digit numbers by a one-digit number using formal written layout Approximating first, use informal pencil and paper methods to multiply and divide. Develop and refine written methods for TU x U. Develop and refine written methods for TU ÷ U.
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS	recognise and use factor pairs and commutativity in mental calculations (repeated) Recognise multiples of 2, 3, 4, 5, 10, up to 10th multiple.
PROBLEM SOLVING	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	*estimate and use inverse operations to check answers to a calculation* (copied from Addition and Subtraction) Explain working. Check with inverse operation. Check results by approximating.

Algebra

EQUATIONS	solve problems, *including **missing number** problems, using number facts, place value, and more complex addition and subtraction.*
	*solve problems, including **missing number** problems, involving multiplication and division, including integer scaling*
FORMULAE	*Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit.* *(Copied from NSG measurement)*
SEQUENCES	Recognise, extend number sequences formed by counting from any number in steps of constant size, e.g. 25 to 500. Recognise, extend number sequences formed by counting from any number in steps of constant size, extend beyond zero if counting back. Solve number puzzles, recognise patterns, generalise and predict.

Fractions (including decimals & percentages)

COUNTING IN FRACTIONAL STEPS	count up and down in hundredths
RECOGNISING FRACTIONS	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten Use fraction notation. Recognise fractions that are several parts of a whole, and mixed numbers. Find fractions of shapes.
COMPARING FRACTIONS	compare and order unit fractions 1/3, ¼ and 1/2, and fractions with the same denominators Relate fractions to division and find simple fractions of quantities. Compare a fraction with one half, and say whether it is greater or less.
COMPARING DECIMALS	compare numbers with the same number of decimal places up to two decimal places Use decimal notation for tenths, hundredths (money, metres and centimetres) and use in context. Order decimals with two places.
ROUNDING INCLUDING DECIMALS	round decimals with one decimal place to the nearest whole number Round to the nearest £ or metre. Convert £ to p, or metres to centimetres, and vice versa.
EQUIVALENCE	recognise and show, using diagrams, families of common equivalent fractions

	Recognise equivalence of simple fractions.
	recognise and write decimal equivalents of any number of tenths or hundredths
	recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$
	Begin to use ideas of simple proportion.
	Recognise the equivalence of decimal, fraction forms of one half, one quarter and tenths.
ADDITION & SUBTRACTION OF FRACTIONS	add and subtract fractions with the same denominator
	Identify two fractions with total of 1.
MULTIPLICATION & DIVISION OF DECIMALS	find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
PROBLEM SOLVING	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
	solve simple measure and money problems involving fractions and decimals to two decimal places.

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	describe positions on a 2-D grid as coordinates in the first quadrant
	Recognise position on square grids with numbered lines.
	describe movements between positions as translations of a given unit to the left/right and up/down
	Read and begin to write the vocabulary of movement.
	plot specified points and draw sides to complete a given polygon
PATTERN	Solve shape problems or puzzles. Explain reasoning and methods.

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	identify lines of symmetry in 2-D shapes presented in different orientations Describe and visualise 3-D and 2-D shapes, inc. tetrahedron, heptagon. Recognise equilateral and isosceles triangles. Visualise solid shapes from 2–D drawings. Identify simple nets. Recognise clockwise, anti-clockwise.
DRAWING & CONSTRUCTING	complete a simple symmetric figure with respect to a specific line of symmetry Sketch reflection of simple shape in a mirror.
COMPARING & CLASSIFYING	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Classify shapes (right angles, regularity, symmetry). Investigate general statements about shapes. Make shapes and discuss properties.
ANGLES	identify acute and obtuse angles and compare and order angles up to two right angles by size Start to draw, measure and order angles. Use eight compass points. Recognise horizontal and vertical lines. Begin to measure angles in degrees. Know whole turn, 360*, 4 right angles; quarter turn, 90*, 1 right angle; half turn, 180°, 2 right angles. Recognise 45* as half a right angle.

Measurement

COMPARING & ESTIMATING	estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)
MEASURING & CALCULATING	estimate, compare and calculate **different measures,** including **money in pounds and pence** (appears also in Comparing) Convert £ to p. Choose appropriate number operations and calculation methods to solve money or 'real life' word problems with one/two steps. **Length:** Use, read, write km, m, cm, mm and mile. Know and use relationships between units. Know 1/2, 1/4, 3/4, 1/10 of 1 kilometre in m, 1 metre in cm or mm. Suggest suitable units and equipment to estimate or measure length

	Record metres and centimetres using decimals, and other measurements using mixed units. Convert up to 1000 cm to metres and vice versa. **Mass:** Measure and compare using kilograms and grams, and know and use the relationship between them. Know 1/4, 1/2, 3/4 and 1/10 of 1 kg in grams. Suggest suitable units and equipment to estimate or measure mass. Record measurements to suitable degree of accuracy, using mixed units, or the nearest whole/half/quarter unit (e.g. 3.25 kg). **Capacity:** Use, read, write litre (l), millilitre (ml), pint. Know 1/4, 1/2, 3/4, 1/10 of 1 litre in ml. Suggest suitable units and equipment to estimate or measure capacity. Record measurements to suitable degree of accuracy, using mixed units, or the nearest whole/half/quarter unit (e.g. 3.25 litres). Read a variety of scales and dials to a suitable degree of accuracy. measure and calculate the **perimeter** of a rectilinear figure and simple shapes (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares Measure and calculate area of rectangles and simple shapes, using counting methods and standard units (square centimetres). Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps. Explain and record methods.
TELLING THE TIME	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) Use, read, write vocabulary of time. Read time to 1 min. on analogue/12-hour digital clock. Use 9:53, a.m. and p.m.

	Estimate and check times using seconds, minutes, hours. Read timetables and use this year's calendar. solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)
CONVERTING	convert between different units of measure (e.g. kilometre to metre; hour to minute) read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
SOLVING PROBLEMS	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. Solve a given problem by collecting, classifying, representing and interpreting data in tally charts, frequency tables, pictograms (symbol) representing 2, 5, 10 units). Solve a given problem by collecting, classifying, representing and interpreting data in bar charts; intervals labelled in 2s, 5s, 10s, 20s. Include use of computer. Solve a given problem by collecting, classifying, representing and interpreting data in Venn and Carroll diagrams: two criteria. Use a computer and a branching tree program to sort shapes or numbers.

Year 5 Maths Objectives

Place Value

COUNTING	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
	Count on/back in equal steps (e.g. 25, 100, 0.1, 0.2), including beyond zero.
COMPARING NUMBERS	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
	Use the vocabulary of comparing and ordering numbers.
	Make general statements about odd and even numbers, including sums and differences.
	Give one or more numbers lying between two others.
	Use symbols $<,\ =,\ >,\ \geq,\ \leq$.
	Order a set of whole numbers less than 1 million.
	Order positive and negative integers (number line, temperature).
	Calculate a temperature rise or fall across 0*C.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	Use vocabulary of estimation and approximation.
	Make and justify estimates of large numbers and estimate simple proportions.
READING & WRITING NUMBERS	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers)
	Read and write whole numbers 100 000
	read Roman numerals to 1 000 (M) and recognise years written in Roman numerals.
UNDERSTANDING PLACE VALUE	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)
ROUNDING	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000

	Round any three or four digit number to the nearest 10, 100 or 1000.
	round decimals with two decimal places to the nearest whole number and to one decimal place
	(copied from Fractions)
PROBLEM SOLVING	solve number problems and practical problems that involve all of the above
	Solve mathematical problems or puzzles. Recognise patterns, generalise
	Make and investigate a general statement about numbers, by finding examples that satisfy it. Suggest extensions.
	Explain a generalised relationship in words.

Addition & Subtraction

NUMBER BONDS	Decimal complements within 1 and 10.
	Recall addition and subtraction facts for each number up to 20.
	Find pairs with sum of 100; derive multiples of 50 with a sum of 1000.
MENTAL CALCULATION	add and subtract numbers mentally with increasingly large numbers
	Revision of mental strategies for adding and subtracting
	- partitioning
	- - doubling
	- - adjusting
	- bonds
	Add / subtract any pair of 2-digit numbers, including crossing 100.
	Find difference by counting up through next multiple of 10, 100, 1000.
	Partition into HTU and add most significant digits first.
WRITTEN METHODS	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
	Also include + and – of money and time
	Use informal pencil and paper methods.
	Extend written methods +/- of two integers less than 10 000 and + and – of pair of decimals both with 1 or 2 decimal places.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

	Check calculations using inverse operation, including with calculator.
	Check by adding in reverse order, including with calculator.
	Check using sums/differences of odd or even numbers.
PROBLEM SOLVING	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	Develop calculator skills and use a calculator effectively.
	Use all four operations to solve money and 'real life' word problems.
	Choose appropriate operations/ calculation methods. Explain working.

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	*count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000*
	(copied from Number and Place Value)
	Multiplication & Division facts e.g x18 by using x9 and multipying.
	Recall facts in x2, x3, x4, x5, x6, x10 tables and derive division facts.
	Begin to recall facts in x7, x8 and x9 tables, squares to 10 x 10.
	Partition to multiply by 2, 5 or 10, and use tests of divisibility.
	Use known facts and place value to multiply and divide mentally.
MENTAL CALCULATION	multiply and divide numbers mentally drawing upon known facts
	Multiply or divide whole numbers up to 10 000 by 10 or 100.
	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
	Multiply and divide any positive whole number up to 10 000 by 10 or 100 and understand the effect.
	Understand the effect of and relationships between the four operations, and the principles of arithmetic laws as they apply to multiplication.
	Know and apply tests of divisibility of 2, 4 , 5, 10 or 100.
	Express a quotient as a fraction, or as a decimal when dividing a whole number by 2, 4, 5, 10 or when dividing £ and pence.
	Round up or down depending on the context.

	Double or halve any number up to 100. Double any whole number to 100 and multiples of 10 to 1000. Use doubling to multiply two-digit numbers by 4. Identify near doubles e.g. 1.5 + 1.6. Halve any two-digit number. Use doubling/halving: double any two digit number. Halve an even number, double the other; multiply by 25 by x 100 then ÷ 4; Multiply by 16 by x 8, then double; find a $^1/_6$ by halving a $^1/_3$. Use closely related facts (derive x19 from x20, x12 from x10 add x2) Partition e.g. 47 x 6
WRITTEN CALCULATION	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 divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Use informal pencil and paper methods to support, record or explain x and ÷. Extend written methods to HTU x U or U.t x U. (whole number remainder) Extend written methods to TU x TU (long multiplication). *Multiply decimals*
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS	Know square numbers to 10 x 10 Identify factors of two- digit numbers. Use factors. Find all the pairs of factors of any number up to 100. Recognise multiples of 6, 7, 8, 9 up to the 10th multiple.
PROBLEM SOLVING	Use all four operations to solve money or 'real life' word problems, including percentages. Choose appropriate operations/calculation methods.

	Use all four operations to solve measurement word problems, including time. Choose appropriate operations/calculation methods. Explain working.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	Approximate first. Check with inverse operation or equivalent calculation.

Algebra

EQUATIONS	solve problems, *including **missing number** problems, using number facts, place value, and more complex addition and subtraction.* Begin to use brackets. *solve problems, including **missing number** problems, involving multiplication and division, including integer scaling*
FORMULAE	*Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit.* *(Copied from NSG measurement)*
SEQUENCES	Recognise, extend number sequences formed by counting from any number in steps of constant size, e.g. 25 to 500. Recognise and extend number sequences formed by counting from any number in steps of a constant size, extend beyond zero when counting back. Recognise and extend sequences formed by adding 6,7,8,9…, starting from any number. Solve number puzzles, recognise patterns, generalise and predict.

Fractions (including decimals & percentages)

COUNTING IN FRACTIONAL STEPS	count up and down in hundredths
RECOGNISING FRACTIONS	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten Recognise simple equivalent fractions, including tenths and hundredths. Know simple fractions as percentages. Relate fractions to decimal forms (including tenths, hundredths), and to percentages.
COMPARING FRACTIONS	compare and order unit fractions 1/3, ¼ and 1/2, and fractions with the same denominators Use fraction notation, including mixed numbers, and vocabulary numerator and denominator. Change an improper fraction to a mixed number. Order fractions.

	Order a set of fractions including mixed numbers, position on a number line. Relate fractions to division and find simple fractions, including 1/10 and 1/100, of numbers and quantities. Use a calculator effectively e.g. to convert fractions to decimals, to find fractions of numbers. Find fractions and simple percentages of whole number quantities.
COMPARING DECIMALS	compare numbers with the same number of decimal places up to two decimal places Use decimal notation for tenths and hundredths, know what each digit represents in numbers with up to two decimal places. Begin to understand percentage as the number of parts in every 100. Order a set of numbers or measurements with same number of decimal places.
ROUNDING INCLUDING DECIMALS	round decimals with one decimal place to the nearest whole number Round a number with one or two decimal places to the nearest integer.
EQUIVALENCE	recognise and show, using diagrams, families of common equivalent fractions recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$ Solve simple problems involving ratio (one for every). Solve problems involving ratio (1 for every) and proportion (1 in every).
ADDITION & SUBTRACTION OF FRACTIONS	add and subtract fractions with the same denominator
MULTIPLICATION & DIVISION OF DECIMALS	find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
PROBLEM SOLVING	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number solve simple measure and money problems involving fractions and decimals to two decimal places.

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	describe positions on a 2-D grid as coordinates in the first quadrant
	Recognise positions, read and plot co-ordinates in the first quadrant.
	describe movements between positions as translations of a given unit to the left/right and up/down
	Recognise directions, and perpendicular and parallel lines.
	plot specified points and draw sides to complete a given polygon
PATTERN	Solve shape problems or puzzles.
	Explain reasoning and methods. Make patterns from rotating shapes.
	Recognise and explain patterns and relationships, generalise and predict.

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	identify lines of symmetry in 2-D shapes presented in different orientations
	Identify and recognise properties of rectangles.
	Classify triangles: isosceles, equilateral, scalene, lines of symmetry.
	Visualise 3-D shapes from 2-D drawings and identify nets of open cube.
	Make and investigate a general statement about shapes.
DRAWING & CONSTRUCTING	complete a simple symmetric figure with respect to a specific line of symmetry
	Recognise reflective symmetry in regular polygons.
	Complete symmetrical patterns with two lines of symmetry at right angles. Reflect shapes in mirror parallel to one side.
	Recognise where shape will be after translation.
COMPARING & CLASSIFYING	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
	Solve shape puzzles. Explain methods and reasoning orally and in writing.
ANGLES	identify acute and obtuse angles and compare and order angles up to two right angles by size

	Understand and use degrees.
	Identify, estimate and order acute and obtuse angles.
	Use protractor to measure and draw acute and obtuse angles to 5*.
	Calculate angles in a straight line.

Measurement

COMPARING & ESTIMATING	estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)
MEASURING & CALCULATING	estimate, compare and calculate **different measures,** including **money in pounds and pence** (appears also in Comparing) **Length:** Measure and draw lines to the nearest mm. Use, read and write standard metric units of length, abbreviations and relationships. Convert larger to smaller units of length. Know mile. Suggest suitable units/equipment to estimate or measure length. **Mass:** Use, read and write standard metric units of mass, abbreviations. Know relationships between them. Convert larger to smaller units of mass. Suggest suitable units and equipment to estimate or measure mass. **Capacity:** Use, read and write standard metric units of capacity, including abbreviations and pint, gallon. Know and use relationships between them. Convert larger to smaller units of capacity, including gallons to pints. Suggest suitable units and equipment to estimate or measure capacity. Record estimates/ measurements from scales to suitable degree of accuracy. measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres

	Understand, measure and calculate perimeter of rectangles, regular polygons. find the area of rectilinear shapes by counting squares Understand area measured in square centimetres. Use formula in words for area of rectangle.
TELLING THE TIME	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) Read the time on 24-hour digital clock, e.g. 19:53. Use timetables. solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)
CONVERTING	convert between different units of measure (e.g. kilometre to metre; hour to minute) Convert metres to centimetres and £ to pence, and vice versa. Convert kg to g. read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time) Know and use relationship between units of time.

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs Discuss chance or likelihood. Identify the mode. Recognise when intermediate points have no meaning. Represent and interpret data in a line graph (e.g. weight of a baby at monthly intervals from birth to one year). Recognise when points can be joined to show trends.

SOLVING PROBLEMS	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
	Present and interpret data on a bar chart and bar line graph: axis in 2s, 5s, 10s, 20s, 100s.
	Make a simple database on paper.
	Solve a problem by representing and interpreting data in bar line charts: axis in 2s, 5s, 10s, 20s, 100s.
	Discuss cases where intermediate points have no meaning and cases where points may be joined to show trend.
	Find the mode and calculate the range of a set of data.
	Use a computer to compare different presentations of the same data.

Year 6 Maths Objectives

Place Value

COUNTING	use negative numbers in context, and calculate intervals across zero
	Count on/back in steps of 25 ,0.2, 0.25, 0.5…
	Count on/back in steps of 0.1, 0.2, 0.25, 0.5. and then back.
COMPARING NUMBERS	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
	Order positive and negative whole numbers;
	Find the difference between a positive and a negative integer, or two negative integers, in the context such as temperature or a number line. Order a set of negative integers.
	Investigate products of odd / even numbers.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	Use vocabulary of estimation and approximation.
READING & WRITING NUMBERS	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)
UNDERSTANDING PLACE VALUE	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)

	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places (copied from Fractions)
ROUNDING	round any whole number to a required degree of accuracy
	Round whole numbers to the nearest 10, 100, 1000.
	solve problems which require answers to be rounded to specified degrees of accuracy (copied from Fractions)
PROBLEM SOLVING	solve number and practical problems that involve all of the above
	Develop calculator skills; use a calculator effectively.
	Solve mathematical problems or puzzles. Recognise patterns, generalise.
	Make general statements about them and give examples.
	Solve number puzzles and explain methods and reasoning.

Addition & Subtraction

NUMBER BONDS	Find pairs with sum of 100; multiples of 50 with sum 1000, decimals with sum of 0.1, 1, 10
MENTAL CALCULATION	perform mental calculations, including with mixed operations and large numbers
	use their knowledge of the order of operations to carry out calculations involving the four operations
	Add/subtract any pair of two-digit numbers including crossing 100;
	Derive sums and differences, e.g. 760 ± 280.
	Add/subtract a multiple of 10, 100, 1000 and adjust.
WRITTEN METHODS	If appropriate, use informal pencil and paper methods.
	Extend written methods to column + and –numbers involving decimals.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
	Choose appropriate operations/calculation methods.
	Explain working.
	Check by adding in reverse order, including with a calculator.

PROBLEM SOLVING	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Solve problems involving addition, subtraction, multiplication and division Use all four operations to solve money or 'real life' word problems.

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	Recall multiplication and division facts to 12 x 12. Use known facts and place value to multiply and divide mentally. Use relationship between multiplication and division.
MENTAL CALCULATION	perform mental calculations, including with mixed operations and large numbers Multiply mentally any two-digit number by a one-digit number. Mentally multiply any two-digit number to 50 by a one-digit number. *associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)* (copied from Fractions) Multiply or divide whole numbers by 10, 100 or 1000. Understand and use relationships between the 4 operations, and the principles of the arithmetic laws. Use related facts and doubling or halving e.g. halve an even number, double the other; multiply by 25, by x 100, then * by 4. Double decimals e.g. 3.8 x 2, 0.76 x 2. Partition, e.g. 87 x6, 3.4 x 3. Express a quotient as a fraction, or as a decimal rounded to 1 decimal place. Dividing £ and pence by a two-digit number to give £ and pence. Round up or down after division depending on the context
WRITTEN CALCULATION	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 for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context Multiply HTU by TU Division HTU by TU (long division, whole number answer). *use written division methods in cases where the answer has up to two decimal places* (copied from Fractions (including decimals)) Use informal pencil and paper methods to support, record or explain x and *. Extend written methods to ThHTU x U and short multiplication involving decimals. Extend written methods to short division of TU or HTU (mixed number answer) and of decimals.
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS	identify common factors, common multiples and prime numbers Give pairs of factors for whole numbers to 100. Use tests of divisibility. Recall squares to 12 x 12. Recognise multiples up to 10 x 10. Find simple common multiples. Know tests of divisibility. Recognise primes to at least 20. Find prime factors. Factorise numbers to 100 into prime factors. *use common factors to simplify fractions; use common multiples to express fractions in the same denomination* (copied from Fractions) *calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3* (copied from Measures)
ORDER OF OPERATIONS	use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy Approximate first. Explain working. Check by estimating. Use inverse operation including with a calculator.
PROBLEM SOLVING	solve problems involving addition, subtraction, multiplication and division

	solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion) Use all four operations to solve money or 'real life' word problems, including finding percentages and VAT. Choose appropriate operations/ calculation methods.

<u>Algebra</u>

EQUATIONS	express missing number problems algebraically Use brackets. find pairs of numbers that satisfy number sentences involving two unknowns enumerate all possibilities of combinations of two variables
FORMULAE	use simple formulae *recognise when it is possible to use **formulae** for area and volume of shapes* (copied from Measurement)
SEQUENCES	generate and describe linear number sequences Recognise and extend number sequences such as square, triangular numbers. Investigate number sequences. Develop a generalised relationship in words; express it in a formula using symbols.

<u>Fractions (including decimals & percentages)</u>

COUNTING IN FRACTIONAL STEPS	Count up and down in ½, ¼, etc using whole numbers and decimal numbers.
RECOGNISING FRACTIONS	Recognise equivalent fractions. Know simple fractions as percentages; find simple percentages. Understand percentage as the number of parts in every 100.
COMPARING FRACTIONS	compare and order fractions, including fractions >1

	Change an improper fraction to a mixed number and vice versa. Reduce fractions by cancelling. Order fractions by converting to common denominator, and position them on a number line. Use fractions as 'operators'; find fractions of numbers and quantities. Begin to convert fractions to decimal using division. Use a calculator to compare two fractions. Express simple fractions as percentages. Find simple percentages of whole number quantities, include using calculator
COMPARING DECIMALS	identify the value of each digit in numbers given to three decimal places Multiply and divide decimals by 10 or 100, and integers by 1000, and explain the effect. Use decimal notation for tenths and hundredths; extend to thousandths for measurements. Know what each digit represents. Give a decimal lying between two others e.g. 3.4 and 3.5. Order a set of mixed numbers or measurements with up to 3 decimal places. Round a number to the nearest tenth or nearest whole number.
ROUNDING INCLUDING DECIMALS	solve problems which require answers to be rounded to specified degrees of accuracy Round decimals to nearest whole number or nearest tenth.
EQUIVALENCE	use common factors to simplify fractions; use common multiples to express fractions in the same denomination associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
ADDITION & SUBTRACTION OF FRACTIONS	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
MULTIPLICATION & DIVISION OF DECIMALS	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) multiply one-digit numbers with up to two decimal places by whole numbers divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)

	multiply one-digit numbers with up to two decimal places by whole numbers
	multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)
	use written division methods in cases where the answer has up to two decimal places
RATIO & PROPORTION	solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
	solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
	solve problems involving similar shapes where the scale factor is known or can be found
	solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Solve simple problems involving ratio and proportion.

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	describe positions on the full coordinate grid (all four quadrants) Read and plot co-ordinates in all four quadrants. draw and translate simple shapes on the coordinate plane, and reflect them in the axes. Recognise where a shape will be after two translations. Recognise where shape will be after 90* rotation about vertex. Recognise where shape will be after reflection in a line not parallel to a side or in two mirrors at 90*. Consolidate work on translations and rotations.

PATTERN	Make and investigate a general statement about shapes.

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing) illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius Solve shape puzzles. Explain methods and reasoning orally and in writing. Visualise 3-D shapes from 2-D drawings. Identify nets of closed cube. Recognise and explain patterns and relationships, generalise and predict.
DRAWING & CONSTRUCTING	draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties) Make shapes with increasing accuracy.
COMPARING & CLASSIFYING	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons Classify quadrilaterals using side/angle properties.
ANGLES	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles Recognise, estimate acute and obtuse angles. Use protractor to measure and draw acute/obtuse angles to 1*. Check angle sum of triangle is 180*. Calculate angles in triangle or around a point.

Measurement

COMPARING & ESTIMATING	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3.
MEASURING & CALCULATING	solve problems involving the calculation and conversion of **units of measure**, using decimal notation up to three decimal places where appropriate (appears also in Converting) **Length:** Use, read and write standard metric units of length, abbreviations and relationships. Convert larger to smaller units of length and vice versa. Know mile and km equivalents. Suggest suitable units/equipment to estimate or measure length Record estimates/measurements from scales to suitable degree of accuracy. Use all four operations to solve measurement word problems, including time. Choose appropriate operations/calculation methods. Explain working. **Mass:** Use, read and write standard metric units of mass and abbreviations. Know relationships. Convert larger to smaller units and vice versa. Know approximate metric equivalents for pounds (lb) and ounces (oz). Suggest suitable units and equipment to estimate or measure mass. **Capacity:** Use, read and write metric units of capacity, including abbreviations. Know and use the relationships between them. Convert larger to smaller units of capacity, and vice versa. Know approximate metric equivalents for pint and gallon. Suggest suitable units and equipment to estimate or measure capacity. recognise that shapes with the same areas can have different **perimeters** and vice versa Calculate perimeter of rectangles and simple compound shapes. calculate the area of parallelograms and triangles

	Use formula for area of rectangle. Calculate the area of a shape formed from rectangles, including using a calculator with memory. calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3]. recognise when it is possible to use formulae for area and volume of shapes
TELLING THE TIME	Appreciate different times around the world.
CONVERTING	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating) convert between miles and kilometres Convert between km, m, cm, mm. Convert between kg and g, litres and millilitres, seconds and minutes.

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and construct pie charts and line graphs and use these to solve problems Use language of probability, including events with equally likely outcomes. Present and interpret grouped discrete data on a bar chart. Use prepared computer database to compare presentations of data. Represent, extract and interpret data in a line graph (e.g. graph to convert miles to kilometres). Recognise that intermediate points have meaning. Extract information from a simple frequency table. and convert the data to percentages, using a calculator where appropriate. Interpret a simple pie chart, using fractions or percentages.

SOLVING PROBLEMS	calculate and interpret the mean as an average Find the mode and range of a set of data. Begin to find median and mean. Solve a problem by representing, extracting and interpreting data in frequency tables and bar charts with grouped discrete data