



West Sussex mathematics progression guidance

Support for teacher assessment



Introduction

Intention

- To provide a supporting document for teachers to facilitate teaching of the National Curriculum statutory programme of study statements.
- To support planning the progression of the learning to achieve each of the end of year statements has been provided.
- To provide a possible strategy for monitoring and recording pupil's learning in relation to the end of year statements.

How each progression grid works

- The progression step grids are divided into the topic headings as they appear in the National Curriculum, for each year group.
- Each end of year statement is in **bold**. These are the statutory requirements of the National Curriculum.
- Below each end of year statement are suggested steps for the progress in learning to achieve the statement. These suggestions are not statutory and should be only used as a guide. It will be necessary to identify the prior learning and mathematical understanding of each pupil to determine a starting point for planning.
- An overview of progression through Key Stages 1 and 2 has been considered.

Working mathematically

- It should be recognised that all topics should reflect the aims of the curriculum that *pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasing sophisticated problems.* (KS1 & 2 mathematics Programme of Study page 3)
- In support of the progression step grids a further document entitled 'Working Mathematically', provides suggestions for the progression of Problem Solving, Developing Fluency/Communicating and Reasoning Mathematically. This is sub-divided into Key Stage 1, Lower Key Stage 2 and Upper Key Stage 2.

Supporting documents

The following documents may support you in making teacher assessment judgements.

- [Mathematics guidance: key stages 1 and 2](#) – Non-statutory guidance for the national curriculum in England
- [Improving mathematics in the early years and key stage 1](#) – Education Endowment Foundation
- [Improving mathematics in key stages 2 and 3](#) – Education Endowment Foundation
- [West Sussex formative assessment guidance](#)

Year 1 Place Value				
Count to and across 100, forwards and backwards, from any number including 0	Count, read and write numbers to 100 in numerals Count in multiples of 2s, 5s and 10s	Given a number identify one more, one less	Identify and represent numbers using objects and pictorial representations, including the number line. Use language of: equal to, more than, less than (fewer), most, least	Read and write numbers from 1 – 20 in numerals and words
Children count reliably forwards and backwards from any given number from 0 or 1 to 90, independently crossing boundaries	Extend counting to at least 50 and group objects, in 1s 2s 10s or 5s to make counting more efficient. (physical objects, money and measures)	Order numbers and images and identify one more or less between given numbers 1 to 100	Partition numbers into 10s and 1s using apparatus to support understanding and begin to work with place value cards	Read and write numerals and words from 1 to 15
Children count reliably forwards and backwards with numbers from 0 or 1 to 50 including crossing boundaries	Counting in 2s, 5s and 10s	Order numbers and images and identify one more or less between given numbers 0 to 50	Begin to partition numbers into 10s and 1s using apparatus that models place value in a visual or physical way to support understanding	Read and write numerals and words from 1 to 10
Children count reliably forwards and backwards with numbers from 0 or 1 to 30 including decades and knowing the number preceding or following. Use apparatus to support crossing boundaries e.g. straws, Numicon, number rods	Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same	Order numbers and images and identify one more or less between given numbers 0 to 30	Begin to compare and order 2-digit numbers and position them on a number line or hundred square. Use comparative language including more than, less than, equal to	Read and write numerals from 1 to 20
Children count reliably forwards and backwards with numbers from 0 or 1 to 20 (ELG + backwards)	Count reliably at least 20 object that can or cannot be moved	Order numbers and images and identify one more or less between given numbers 0 to 20	Match objects to corresponding numerals	Read write numerals from 1 to 10
				Read (on cards, number lines, 100 squares, clocks) and record (written and using place value cards) numerals to 20

Year 1 Number Addition & Subtraction			
Read, write and interpret mathematical statements involving addition, subtraction and equals signs	Represent and use number bonds and related subtraction facts within 20	Add and subtract one-digit and two-digit numbers to 20, including zero	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7=X-9$
Use the vocabulary related to subtraction and symbols to describe and record subtraction number sentences	Use and apply knowledge of number bonds and related subtraction facts to 20	Understand the effect of adding or subtracting zero to a number	Refer to 'Working Mathematically' document
Use the vocabulary related to addition and symbols to describe and record addition number sentence	Recall rapidly all addition and subtraction facts for each number to at least 20 (eg doubles, bonds to 20, $15+2=17$) **	Using quantities and objects, add and subtract two single digit numbers and count on or back to find the answer (ELG)	
Understand that equals means equal to, balances or equivalent to	Begin to recall all addition and subtraction facts for each number to at least 20 (e.g. doubles, bonds to 20, $15+2=17$) **		
Understand subtraction as "taking away" objects from sets and finding how many are left and use related vocabulary **	Recall rapidly all addition and subtraction facts for each number to at least 10 (e.g. doubles, halves bonds to 10, $7-5=2$) **		
Understand addition as finding the total of 2 or more sets of objects and use related vocabulary **	Begin to recall all addition and subtraction facts for each number to at least 10 (e.g. doubles, bonds to 10, $5+2=7$) **		
	Use structured apparatus to explore addition and subtraction facts within 20 e.g. Numicon, pegs on a hanger, handprints, number rods, ten frames		
	Use structured apparatus to explore addition and subtraction facts within 10 e.g. Numicon, pegs on a hanger, handprints, number rods, ten frames		

Year 1 Number Multiplication, Division & Fractions		
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	Recognise, find and name a half as one of two equal parts of an object, shape or quantity. Use the expression 'fraction of'	Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. Use the expression 'fraction of'
Make connections between arrays, number patterns, and counting in 2s, 5s and 10s	Work out halves of numbers up to 20 and begin to recall them	Begin to use halves and quarters in practical context (such as sharing sweets between 2 and getting half each, and sharing between 4 and getting a quarter each, folding a piece of paper into 4 and finding a quarter)
Understand multiplication and division as an array	Relate the concept of half a small quantity to the concept of half of a shape (shade one half or one quarter of a given shape including those divided into equal regions)	Understand the relationship between halves and quarters – 2 quarters make a half
Understand multiplication as repeated addition and division as grouping and sharing, including shown as jumps on the number line	Begin to use the fraction one half (halve shapes, including folding paper shapes, lengths of string, put water in clear containers so that it is about "half full", halve an even number of objects)	Understand that 4 quarters make a whole
In practical context understand multiplication as repeated addition and division as grouping or sharing		Begin to use the fraction one quarter (quarter of a regular shape)
		Understand the connection between one half and sharing into 2 equal groups

Year 1 Measurement					
Compare, describe and solve practical problems for: <ul style="list-style-type: none"> • Lengths and heights • Mass and weight • Capacity and volume • Time 	Measure and begin to record the following: <ul style="list-style-type: none"> • Lengths and heights • Mass and weight • Capacity and volume • Time (hours, mins and secs) 	Recognise and know the value of different denominations of coins and notes	Sequence events in chronological order using appropriate language	Recognise and use language relating to dates, including days of the week, weeks, months and years	Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
Use and compare different types of quantities and measures using manageable common standard units	Begin to record using standard measures	Understand the value of coins using apparatus to support e.g. stick coins onto Numicon or towers of unifix	Understand and use the terms <ul style="list-style-type: none"> • before and after • next, first, today, yesterday, tomorrow, morning, afternoon and evening 	Know the months of the year and can put them in order	Read an analogue clock to the half hour
Use and compare different types of quantities and measures using non-standard units	Begin to use standard measuring tools <ul style="list-style-type: none"> • Rulers/trundle wheels • Weighing scales • Containers • Clocks 	Recognise and know the names for different notes	Sequence familiar events	Know the names of the days of the week and can put them in order	Read an analogue clock to the hour
Understand and use the terms <ul style="list-style-type: none"> • Long, short, longer, shorter, tall, short, double, half • Heavy, light heavier than, lighter than • Full, empty, more than, less than, quarter full • quicker, slower, earlier, later 	Understand the need for standard units when measuring through the use of non-standard measures	Recognise and know the names for each coin		Use mathematical words to describe time – late, early, old, new etc	Know o'clock times that relate to everyday life – lunch time, home time, dinner time, bedtime
		Know what money is used for			

Year 1 Geometry	
<p>Recognise and name common 2D and 3D shapes, including:</p> <ul style="list-style-type: none"> • 2D shapes (rectangles, (including squares) circles and triangles) • 3D shapes (cuboid (including cubes), pyramids and spheres) 	<p>Describe position, direction and movement, including whole, half, quarter and three-quarter turns.</p>
<p>Recognise shapes in different orientations, sizes and contexts (regular and irregular) e.g. in tiles, window panes etc</p>	<p>Use the language of position, direction and motion</p> <ul style="list-style-type: none"> • Left and right • Top, middle and bottom • On top of • In front of • Above, between around • Near • Close and far • Up and down • Forwards and backwards • Inside and outside
<p>Relate shapes to everyday objects and match solid and flat shapes to pictures and names of them</p>	<p>Turn in both directions, connecting turning clockwise with the movement on a clock face</p>

Year 2 Number and Place Value					
Count in steps of 2, 3 and 5 from 0 and in tens from any number, forwards and backwards	Recognise the place value of each digit in a two-digit number including zero as a place holder (tens, ones)	Identify, represent and estimate numbers using different representations, including the number line	Compare and order numbers from 0 up to 100: use <, >, and = signs	Read and write numbers to at least 100 in numerals and in words	Use place value and number facts to solve problems
Count forwards and backwards in steps of 3 to and from 0	Partition and recombine 2-digit numbers into tens and units	Represent larger numbers using mathematical apparatus and show on a number line, hundred square and 200 grid	Use symbols and language to compare groups of objects and numbers	Read and write number words and numerals to 100	Refer to 'Working Mathematically' document
Count forwards and backwards in steps of 5 to and from 0	Be able to identify the value of each digit in a 2-digit number	Represent numbers to 50 using mathematical apparatus (e.g. Numicon, bead strings, number rods) and show on a number line and hundred square	Identify < and relate to numbers and quantities that are less than, smaller than, fewer than etc.	Match number words and numerals to 100	
Count forwards and backwards in steps of 2 to and from 0	Recognise 0 as a place holder in multiples of 10	Estimate objects up to 50 in context where counting is not easy. Suggest an estimate within a sensible range	Identify > and relate to numbers and quantities that are greater than, bigger than, more than etc.	Read and write numbers to 50 in words	
Count forwards and backwards in steps of 10 from any number	Show 2-digit numbers using pre-structured materials e.g. place value cards, Numicon, base ten etc.	Represent numbers to 20 using objects, a number line and hundred square	Relate the = sign to equal to, equivalent to using balance scales and other structured apparatus	Match number words and numerals to 50	
Count forwards and backwards in steps of 10 from 0 to 100	Structure materials to show 2-digit numbers e.g. bundles of straws	Estimate objects up to 20	Order numbers with their images up to 100	Read and write numbers in words to 30	
Count forwards and backwards in steps of 2 from 0 to 20			Begin to order a selection of non-consecutive numbers or images up to 100	Consolidate reading and writing numerals to 100 from year 1	

Year 2 Number Addition & Subtraction				
<p>Solve problems with addition and subtraction</p> <ul style="list-style-type: none"> • using concrete objects and pictorial representations, including those involving numbers, quantities and measures. • applying their increasing knowledge of mental and written methods 	<p>Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.</p>	<p>Add and subtract numbers using concrete objects, pictorial representations and mentally, including</p> <ul style="list-style-type: none"> • a two-digit number and ones • a two-digit number and tens • two 2-digit numbers • adding three one-digit numbers 	<p>Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. (e.g. $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$)</p>	<p>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p>
Refer to 'Working Mathematically' document	Know number bonds of 100	Begin to develop mental strategies to add and subtract (using number lines, hundred squares) and connect to the concrete/pictorial images	Understand that subtraction is not commutative and that changing the order of the numbers gives a <u>different answer</u>	Begin to check calculations including adding to check subtraction and adding numbers in different orders to check addition
	Begin to use known facts to calculate e.g. using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$.	Use pictorial representations and own drawings to accurately add and subtract	Begin to add numbers in different orders to check addition	Use structured apparatus to explore inverse
	Consolidate addition and subtraction facts to 20 from year 1	Use concrete objects to add and subtract accurately	Understand the terms sum and difference and apply them to concrete objects to illustrate that addition is commutative	Explore patterns and relationships between addition and subtraction using concrete objects

Year 2 Number Multiplication, Division & Fractions					
Recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, relate to grouping and sharing, including recognising odd and even numbers	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals signs	Show that multiplication of two numbers can be done in any order (commutative) and division of one number from another cannot	Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context	Recognise, find, and name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a length, shape, set of objects or quantity	Write simple fractions for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
Learn 5 times table and link to the divisions on a clock face. Explore connections to 10 times table and odd/even multiples	Know the symbol for division and link to group, share equally, divide	Use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$)	Refer to 'Working Mathematically' document	Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (for example, $1 \frac{1}{4}$, $1 \frac{2}{4}$ (or $1 \frac{1}{2}$) $1 \frac{3}{4}$, 2) to reinforce the concept of fractions as numbers that can be greater than one	Connect unit fractions to equal sharing and to numbers when they can be calculated, and to measures
Learn 10 times table and include discussions about the effect of multiplying and dividing by 10 on the place value of the digits	Consolidate multiplication and division understanding from year 1	Understand a range of vocabulary for multiplication and division and apply them to concrete objects		Understand the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ in practical contexts	Know the terms numerator and denominator and what each digit represents through practical activities
Become fluent with doubling and halving and link to 2 times table		Use concrete objects to understand that division is not commutative and changing the order of the numbers gives a <u>different answer</u>		Connect unit fractions to equal sharing finding fractions of lengths, quantities, sets of objects or shapes	
		Use concrete objects to explore how multiplication can be done in any order		Recognise $\frac{3}{4}$ as an example of a non-unit fraction	
				Understand the role of the numerator & denominator – link to multiplication & division	

Year 2 Geometry					
Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line (including quadrilaterals and polygons)	Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces (including cuboids, prisms and cones)	Identify 2-D shapes on the surface of 3D shapes [for example a circle on a cylinder]	Compare and sort common 2D and 3D shapes and everyday objects	Order and arrange combinations of mathematical objects in patterns and sequences	Use mathematical vocabulary to describe the 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 draw lines and shapes using a straight edge	Read and write names for shapes that are appropriate for their word reading and spelling	Identify 2D shapes <u>in</u> 3D objects in the environment	Explain comparisons and groupings using precise vocabulary	Place shapes in simple sequences	Link $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ turns to fractions
Read and write names for shapes that are appropriate for their word reading and spelling	Use vocabulary precisely to describe shapes	Identify 2D and 3D shapes in the environment	Compare and sort shapes on the basis of their properties	Explore patterns including shapes and objects in different orientations	Program robots using 'right angles' for instructions
Find lines of symmetry by folding shapes	Identify properties of each shape including number of faces, vertices and edges		Sort everyday objects using their own criteria	Explore patterns of shapes	Recognise right angles in turns
Begin to recognise right angles in 2D shapes	Handle and name common 3D shapes including cuboids, prisms and cones				Use the terms clockwise and anti-clockwise
Use vocabulary precisely to describe shapes					Describe turns e.g. pupils moving in turns and instructing other pupils to do so
Identify and describe the properties of each shape such as number of sides					Consolidate all vocabulary from Year 1 geometry
Handle and name a wide range of common 2D shapes (regular and irregular)					

Year 2 Measurement							
Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (Kg/g); temperature (C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	Compare and order lengths, mass, volume/capacity and record the results using >, < and =	Recognise and use symbols for pounds and pence: combine amounts to make a particular value	Find different combinations of coins that equal the same amount of money	Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	Compare and sequence intervals of 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 (analogue clock)	Know the number of minutes in an hour and the number of hours in a day
Use appropriate language and record using standard abbreviations	Use simple multiples such as "half as high", "twice as wide"	Combine coins to make a particular value	Find different ways to pay a total	Begin to count on/use subtraction to give change	Make comparisons between periods of time e.g. weeks in a month, months in a season	Read and write the time in 5 min intervals (past and to)	Recognise the minute markings on a clock face
Use standard units of measure with increasing accuracy		Read and say amounts of money confidently	Recognise a range of different coins can be combined to make the same value	Add values together practically	Understand the links between days/months/years	Read and write the time to a quarter hour (past and to)	
		Develop fluency in counting with coins					

Year 2 Statistics		
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 categories by quantity.	Ask and answer questions about totalling and comparing categorical data.
Record, interpret, collate, organise and compare information in 2s, 5s and 10s	Answer simple questions by counting objects carefully depending on the scale given	Use the language of more than, less than and equal to, to compare the data given
Record, interpret, collate, organise and compare information in 1s	Ask a simple question with support about the number of objects in a category	
Construct block diagrams with a variety of purposes		
Recognise a block diagram and be able to describe it		
Construct pictograms with a variety of purposes		
Recognise a pictogram and be able to describe it		
Construct tally charts with a variety of purposes		
Recognise a tally chart and be able to describe it		

Year 3 Number and Place Value					
Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	Compare and order numbers up to 1000	Identify, represent and estimate numbers using different representations	Read and write numbers up to 1000 in numerals and in words	Solve number problems and practical problems involving these ideas.
Count in multiples of 4, 8, 50 and 100	Use larger numbers to 1000 applying partitioning related to place value e.g. $146 = 100 + 40 + 6$	Begin to compare and order 3-digit numbers and position them on a number line	Build on representations from Year 2 and explore larger quantities	Read 3-digit numbers that are a multiple of 10 or 100 and be able to write them in numerals and words	Refer to 'Working Mathematically' document
Begin to recognise the relationship between multiples of 4 and 8 and 50 and 100	Know what each digit in a 3-digit number represents, (including 0 as a place holder) and partition 3-digit numbers into 100s, 10s and 1s	Compare and order numbers beyond 100 and confidently explain understanding	Develop strategies for estimation based on Year 2 knowledge		
Consolidate counting in multiples of 2, 3, 5, 10 from year 1	Understand the value of each digit but also the relationship to the total value of hundreds, tens or units e.g. 308 – value of digit in the tens column is zero but there are 30 tens	Compare and order numbers beyond 100 using $<$ $>$ and $=$			
Understand the term multiple					

Year 3 Number – Addition and Subtraction			
Add and subtract numbers mentally, including: <ul style="list-style-type: none"> • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds 	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	Estimate the answer to a calculation and use inverse operations to check answers	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
Know an increasing range of number bonds e.g. bonds to 500, 1000	Use formal written methods and link to base 10 apparatus e.g. on a calculation mat	Consolidate recognition and use of the inverse relationship from year 2	Refer to 'Working Mathematically' document
Apply knowledge of partitioning, number order and patterns to calculate e.g. to add 19, add 20 and subtract 1. To subtract 7 from 125, subtract 5 and then 2	Use expanded written methods to add and subtract numbers with up to 3 digits e.g. partitioning and recombining and link to base 10 apparatus	Use knowledge of rounding to make informed estimates.	
Apply knowledge of partitioning to support mental calculations	Use informal written methods to add and subtract numbers with up to 3 digits e.g. number line	Round to the nearest ten and hundred	
Can use mental recall of addition and subtraction facts from KS1			

Year 3 Multiplication and Division		
Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	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	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
Use multiplication and division facts in calculations and context	Begin to use formal methods, understanding the place value of each digit. Link to structured objects e.g. on a calculation mat	Solve correspondence problems e.g. 4 hats and 3 coats, how many different outfits? Each hat could be worn with each coat $4 \times 3 = 12$
Link multiplication facts to division facts	To use informal written methods to multiply and divide e.g. grid method, chunking and linking to structured objects (as an array)	Use multiplication tables to apply to a scaling context e.g. 4 times as high, 8 times as long
Through doubling is able to connect the 2, 4 and 8 times tables	To use a number line to multiply and divide	Refer to 'Working Mathematically' document
	Use mental recall to derive related facts e.g. $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$	
	Use multiplication facts to develop efficient multiplication methods e.g. $3 \times 4 = 12$, $30 \times 4 = 120$	

Year 3 Fractions						
Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	Recognise and show, using diagrams, equivalent fractions with small denominators	Add and subtract fractions with the same denominator within one whole [for example, $5/7 + 1/7 = 6/7$]	Compare and order unit fractions, and fractions with the same denominators	Solve problems that involve all statements
Connect tenths to place value, decimal measures and to division by 10	Find non-unit fractions of sets of objects using multiplication and division facts e.g. $2/3$ of 27	Understand unit and non-unit fractions as numbers on the number line	Record equivalent fractions with small denominators pictorially	Subtract fractions (with the same denominator) using objects to support understanding	Use a number line to order unit fractions	Refer to 'Working Mathematically' document
Find concrete examples of tenths e.g. rulers, measuring jugs	Revise unit fractions of sets of objects e.g. $1/3$ of 27		Recognise the equivalence of fractions e.g. $1/2$ s, $1/4$ s and $1/8$ s using pictures and objects	Add fractions (with the same denominator) using objects to support understanding e.g. folded strips of paper/ribbon, Lego	Compare and order fractions using objects and pictures	

Year 3 Measurement						
Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Measure the perimeter of simple 2-D shapes	Add and subtract amounts of money to give change, using both £ and p in practical contexts	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 and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight	Know the number of seconds in a minute and the number of days in each month, year and leap year	Compare durations of events [for example to calculate the time taken by particular events or tasks]
Use knowledge of addition and subtraction to calculate with measures	Understand the term perimeter and relate to addition or multiplication (rectangles)	Consolidate knowledge from year 2 and extend to larger amounts	Understand the link between the 12 and 24 hour clock	Comparing units of time e.g. how many seconds in two minutes		Calculate differences between times
Compare measures including simple scaling by integers e.g. a measure is twice as long, five times as high			Use colon to write digital time	Estimate the length of different time measures e.g. put your hand up after 1 minute		Plot start and finish times on a number line
Measure using mixed units			Read and write roman numerals I - XII	Make links between units of time - seconds, minutes, hours		Understand start and finish times of events
Know the relationships between units e.g. 5m=500cm			Use the terms past and to for analogue clock times	Identify times that are earlier than or later than a given time		

Year 3 Geometry			
Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	Recognise angles as a property of shape or a description of a turn	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	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
Use structured and unstructured materials to build 3D shapes	Identify angles within shapes	Identify angles smaller or greater than a right angle	Understand the term perpendicular and recognise perpendicular lines in shapes and the environment
Draw straight lines accurately using a ruler and cm		Understand the relationship between right angles and turns	Understand the term parallel and recognise parallel lines in shapes and the environment
Identify symmetrical and non-symmetrical polygons and polyhedral		Identify right angles using equipment to support e.g. right angle checker	Understand the term vertical and recognise vertical lines in the world around us and in shapes
Use structured materials to build 2D shapes e.g. pattern blocks, peg boards			Understand the term horizontal and recognise horizontal lines in the world around us and in shapes
Identify and describe properties of 2D and 3D shape from Key Stage 1			

Year 3 Statistics	
Interpret and present data using bar charts, pictograms and tables	Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables
Compare the presentation of data in bar charts, pictograms and tables	Refer to 'Working Mathematically' document
Be able to decide how to present the data collected	Connect understanding of 'difference' and 'how many more' to data contexts
Read scales labelled in 2s, 5s and 10s including reading between labelled divisions such as a point halfway between 40 and 50 or 8 and 10	

Year 4 Number and Place Value								
Count in multiples of 6, 7, 9, 25 and 1000	Find 1000 more or less than a given number	Count backwards through zero to include negative numbers	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	Order and compare numbers beyond 1000	Identify, represent and estimate numbers using different representations	Round any number to the nearest 10, 100 or 1000	Solve number and practical problems with increasingly large positive 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
Link multiples of 25 to 50 and 100	Find 1000 more or less than a decimal number	Identify negative numbers on a number line in relation to zero	Recognise the multiplicative value in place value e.g. 1000 is 100 times as big as 10	Compare and order 4-digit numbers and position them on a number line	Represent numbers using structured apparatus e.g. place value counters, counting stick	Round to the nearest 1000 any number up to and including 4-digit numbers	Refer to 'Working Mathematically' document	Identify patterns and repeating digits/letters
Link understanding of the 3 times table to the 6 times table	Find 1000 more or less than any whole number including where a negative number is generated	Identify negative numbers in context e.g. thermometer floors in a lift	Use 4-digit numbers and apply partitioning related to place value e.g. $1572 = 1000 + 500 + 70 + 2$	Compare and order numbers beyond 1000 using $<$ $>$ and $=$	Apply estimation strategies from Yr3 to larger numbers	Round to the nearest 100 any number up to and including 4-digit numbers		Compare Roman system with the modern system (similarities/differences/ the use of zero)
Use number grids to spot patterns and relationships in multiples	Find 1000 more or less than any whole number over 1000					Round to the nearest 10 any number up to and including 4-digit numbers		Identify Roman numerals in history and the modern world e.g. news/books
	Find 1000 more than a multiple of 10					Understand the rules of rounding up and down		

Year 4 Number – Addition and Subtraction		
Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	Estimate and use inverse operations to check answers to a calculation	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
Use knowledge of decomposition to subtract accurately including on a calculation mat	Use knowledge of rounding to estimate answers to a calculation	Refer to 'Working Mathematically' document
Use expanded written methods to add and subtract numbers with up to 4 digits	Consolidate estimation and the inverse from Year 3	
Use formal written methods and link to structured apparatus e.g. Numicon, place value counters, base 10		

Year 4 Multiplication and Division				
Recall multiplication and division facts for multiplication tables up to 12×12	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	Recognise and use factor pairs and commutativity in mental calculations	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	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
Use multiplication and division facts in calculations and in context	Practice mental methods and extend this to three-digit numbers to derive facts (600 divided by 3 = 200 can be derived from $2 \times 3 = 60$)	Apply commutativity in mental calculations e.g. $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$	Compare the grid method to the short formal method identifying similarities and differences	Write statements about the equality of expressions (use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and the associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$)
Through doubling and halving be able to connect the 3, 6, and 12 times tables	Use facts already known to derive new multiplication facts e.g. If I know $10 \times 6 = 60$ then $12 \times 6 = 60 + (2 \times 6)$	Use factor pairs to calculate e.g. to multiply by 20, multiply the number by 2 and then 10 or 5 and then 4	To use informal written methods to consolidate place value and understanding when multiplying e.g. grid, sectioned array	Solve correspondence questions such as 3 cakes shared equally between 10 children
	Discuss the effects of multiplying and dividing by 0 and 1 and model with concrete objects	Find factors of numbers		Use multiplication tables to apply to a scaling context e.g. 4 times as high, 8 times as short
		Understand the term factors and the difference between a factor and a multiple		Refer to 'Working Mathematically' document

Year 4 Fractions (including decimals) (1)				
Recognise and show, using diagrams, families of common equivalent fractions	Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	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	Add and subtract fractions with the same denominator	Recognise and write decimal equivalents of any number of tenths or hundredths
Use factors and multiples to recognise equivalent fractions and simplify where appropriate	Connect hundredths and tenths to place value and decimal measure	Understand relationship between non-unit fractions & multiplication and division of quantities, with particular emphasis on 100ths & 10ths	Subtract fractions (with the same denominator) that go beyond a whole, using objects to support understanding	Understand the place value of each digit when writing hundredths and tenths
Consolidate equivalent fractions from year 3	Count using simple fractions and decimals backwards e.g. in halves, quarters, tenths, hundredths	Find non-unit fractions using pictorial representations and objects	Add fractions (with the same denominator) that are > 1 , using objects to support understanding	
	Count using simple fractions and decimals forwards e.g. in halves, tenths, quarters, hundredths			
	Make the link and recognise that 0.3 is equivalent to $\frac{30}{100}$			

Year 4 Fractions (including decimals) (2)				
Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	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	Round decimals with one decimal place to the nearest whole number	Compare numbers with the same number of decimal places up to two decimal places	Solve simple measure and money problems involving fractions and decimals to two decimal places
Link 0.25, 0.5 and 0.75 to parts of 100 e.g. using 100 grid as 1 or the Numicon enlarged 1 (recognising the base board as one whole)	Divide a number by 100 and understand how the digits should shift	Apply the rules of rounding to numbers with 1 decimal place	Compare and order decimal numbers using < > = and number lines	Refer to 'Working Mathematically' document
	Divide a number by 10 and understand how the digits should shift		Understand how 0 affects value of a number to 2 dp e.g. $36.05 < 36.5$ including in meaningful contexts	
	Divide a number by 10 and understand how the quantity changes to 10 times as small		Identify numbers up to two decimal places in different contexts e.g. money, length	

Year 4 Measurement					
Convert between different units of measure [for example, kilometre to metre; hour to minute]	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Find the area of rectilinear shapes by counting squares	Estimate, compare and calculate different measures, including money in pounds and pence	Read, write and convert time between analogue and digital 12- and 24-hour clocks	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days
Use multiplication and division to convert between different units of measure	Understand perimeter can be expressed algebraically as $2(a+b)$ where a and b are the dimensions in the same unit	Use practical opportunities to explore area	Choose the appropriate apparatus when calculating e.g. using measuring tools appropriate to what is being measured	Understand the links between 12 and 24 hour clocks	Refer to 'Working Mathematically' document
Build on place value and decimal numbers to record metric measures	Measure and calculate perimeter in metres. Use practical opportunities to measure and calculate perimeter e.g. our classroom, playground etc.	Relate area to array patterns	Develop effective strategies for estimating measures e.g. using non-standard measures – cups, parts of the body etc.		
	Measure and calculate perimeter in centimetres. Use practical opportunities to measure and calculate perimeter e.g. our desk, paving stones etc.	Understand what the term area means and how it is different to perimeter			

Year 4 Geometry						
Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	Identify acute and obtuse angles and compare and order angles up to two right angles by size	Identify lines of symmetry in 2-D shapes presented in different orientations	Complete a simple symmetric figure with respect to a specific line of symmetry	Describe positions on a 2-D grid as coordinates in the first quadrant	Describe movements between positions as translations of a given unit to the left/right and up/down	Plot specified points and draw sides to complete a given polygon
Compare lengths and angles to decide if a polygon is regular or irregular	Understand the term obtuse	Identify more than one line of symmetry in 2D shapes	Draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry	Read co-ordinates in the 1 st quadrant	Move objects between positions and describe the movements e.g. using pieces on a chessboard	Write and plot pairs of co-ordinates in the first quadrant
Classify different quadrilaterals e.g. parallelogram, rhombus, trapezium, rectangle, square	Understand the term acute	Identify one line of symmetry in 2D shapes	Recognise lines of symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape	Understand co-ordinates i.e. what they are and what they show	Physically move between positions and describe the movements made	Draw a pair of axis in one quadrant with equal scales and integer labels
Classify different triangles e.g. isosceles, equilateral and scalene						

Year 4 Statistics	
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs
Understand and use a greater range of scales in representations e.g. time graphs for a cycle race	Refer to 'Working Mathematically' document
Begin to relate the graphical representation of data to recording change over time e.g. in contexts such as temperature change	
Understand the term continuous data and contexts in which it is meaningful e.g. height. Compare continuous data to discrete data e.g. shoe size	

Year 5 Number and Place Value					
Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	Interpret negative numbers in context, count forwards and backwards with positive and negative numbers, including through zero	Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	Solve number problems and practical problems	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals
Read, write, order and compare any number between 100 000 and 1 000 000 including in meaningful contexts e.g. populations of cities	Count on and back in powers of 10 to 1 000 000	Compare and order negative numbers and positive numbers including in meaningful contexts e.g. owing money, which temperature is cooler?	Round any number to nearest 100 000	Refer to 'Working Mathematically' document	Read Roman numerals to the current year
Read, write order and compare numbers to at least 100 000	Count on and back in powers of 10 to 100,000	Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule	Round any number to the nearest 10,000		Read Roman numerals to 1000 (M)
Read, write, order and compare numbers to at least 10 000	Understand what a power of 10 is	Count forward and backwards through zero	Consolidate rounding from Year 4		Read Roman numerals to 500 (D) and recognise years written in numerals
Consolidate reading and writing of numbers from year 4	Count on and back in multiples of 10 to 1 000 000				
	Count on and back in multiples of 10 between 10 000 and 100 000				

Year 5 Number – Addition and Subtraction			
Add and subtract numbers mentally with increasingly large numbers	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Using rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Solve addition and subtraction in different contexts. (e.g. real-life contexts including money)	Use the formal written methods of columnar addition and subtraction and link to place value (possibly place value counters on a calculation mat)	Interpret the answer to a calculation relevant to the context by rounding up or down E.g. egg boxes, coaches	Refer to 'Working Mathematically' document
Have a range of appropriate mental methods to use including a demonstrative understanding of place value	Understand using columnar methods the partitioning of place value for more than four digits 5627-3612= (5000 600 20 7) (3000 600 10 2) Link to using place value counters on a calculation mat		Appropriately choose and use number facts and derivation of facts
Practice mental calculations with increasingly large numbers to aid fluency (for example, 12462-2300=10162)			
Encourage derivation of new facts from facts already known			
Consolidate and ensure retention of earlier mental addition and subtraction facts			

Year 5 Multiplication and Division (1)					
Multiply and divide numbers mentally drawing upon known facts	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	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	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
Use known multiplication table facts to work out the inverse or to find answers to numbers outside known table facts. E.g. $7 \times 8 = 56$ so $70 \times 80 = 5600$	Multiply and divide decimal numbers by 10, 100 and 1000 including in meaningful contexts e.g. money Understand the place value relationship between numbers e.g. 2370 is 100 times as big as 23.70	Multiply a 4-digit number by a two-digit number using an appropriate formal written method, E.g. Using long multiplication.	Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders as fractions, as decimals or by rounding	Refer to 'Working Mathematically' document	Use multiplication & division as inverses to support the introduction of ratio in year 6, e.g. by multiplying & dividing by powers of 10 in scale drawings or by multiplying & dividing by powers of a 10 in converting between units e.g. km and m
Apply all the multiplication tables and related division facts frequently committing them to memory.	Multiply and divide whole numbers by 10, 100 and 1000	Multiply a 4-digit number by a two-digit number using a written method in 8 steps E.g. using the expanded written method	Apply knowledge of division and place value to calculate using the formal written method of short division. Link to chunking	Consolidate understanding of the equals sign	Solve problems involving simple rates e.g. mph, currency
Encourage derivation of new facts from those already known	Understand the multiplicative relationships in place value e.g. 2370 is 100 times as small as 237000	Multiply a 4-digit number by a two-digit number using a written method in 8 steps E.g. using grid method	Divide a 4 digit by a one-digit number using an informal written method of short division and interpret remainders appropriately for the context. e.g. chunking		Solve problems involving scaling by simple fractions e.g. by $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{10}$
Consolidate and ensure retention of earlier mental multiplication and division facts		Multiply a 4-digit number by a one-digit number using a formal written method and link this to the grid method in 4 steps	Divide numbers up to 3 digits by a one-digit number using an informal written method of short division and interpret remainders appropriately for the context e.g. chunking		

Year 5 Multiplication and Division (2)				
Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	Establish whether a number up to 100 is prime and recall prime numbers up to 19	Recognise and use square numbers and cube numbers, and the 2 notation for squared and 3 for cubed	Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
Find all common factors of two numbers	Know that prime numbers have only one set of factors (one and itself)	Use known facts to identify prime numbers to 100	Understand the term 'cube number' and identify cube numbers using correct notation	Refer to 'Working Mathematically' document
Find all factor pairs of a number. Identify that a square number has an odd number of factors		Find the prime numbers up to 20	Use practical apparatus to explore cube numbers e.g. multilink arranged in cube patterns	
		Identify multiples in a 100 square leaving the primes. Understand that prime numbers have only one set of factors. Know that 2 is the first prime number	Understand the term 'square number' and identify square numbers using correct notation up to 100	
			Use practical apparatus to explore square numbers e.g. counters arranged in square patterns	

Year 5 Fractions (including decimals and percentages) (1)					
Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	Compare and order fractions whose denominators are all multiples of the same number	Read, write, order and compare numbers with up to three decimal places	Round decimals with two decimal places to the nearest whole number and to one decimal place	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Read and write decimal numbers as fractions (e.g. $0.71 = 71/100$)
Recognise and use decimal equivalents up to thousandth's	Revise comparing and ordering unit fractions and fractions with the same denominators from Year 4		Round numbers with 2 decimal places to one decimal place	Recognise equivalent fractions through models and diagrams e.g. link to 100 square	Recognise and locate 100ths on a number line as both decimal numbers and fractions
Recognise and use place value up to thousandth's	Connect equivalent fractions that simplify to integers with division		Round numbers with 2 decimal places to the nearest whole number	Recognise equivalent fractions using apparatus e.g. a fraction wall	Recognise and locate 10ths on a number line as both decimal numbers and fractions
Use apparatus to understand place value links e.g. Numicon, Diennes					

Year 5 Fractions (including decimals and percentages) (2)					
Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction	Add and subtract fractions with the same denominator and multiples of the same number	Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$)	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	Solve problems involving numbers up to three decimal places	Solve problems which require knowing percentage and decimal equivalents of $1/2, 1/4, 1/5, 2/5, 4/5$ and those with a denominator of a multiple of 10 or 25
Recognise percentage as fractions with denominator of 100	Extend their understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number	Convert improper fractions to mixed numbers and vice versa	Understand why it is only the numerator which changes when you multiply a proper fraction by a whole number	Refer to 'Working Mathematically' document	Know and understand decimal equivalents to fractions with denominators of multiples of 10 and 25 using materials to support
Be able to explain % as parts of 100	Add and subtract fractions becoming fluent through a variety of increasingly complex problems e.g. using fractions that are multiples of the same numbers	Write mathematical statements as mixed numbers greater than 1	Use diagrams to show what happens when you multiply a mixed number by a whole number		Know and understand decimal equivalents to $1/5, 2/5, 4/5$ using materials to support
Recognise a percent as parts of 100 using apparatus e.g. 100 square		Understand the relationship between improper fractions and mixed numbers	Use materials to understand what happens when you multiply a mixed number by a whole number		Know and understand percentage equivalents of those with denominators of multiples of 10 and 25 using materials to support
		Understand the relationship between a mixed number and an improper fraction using apparatus e.g. cups			Know and understand percentage equivalent of $1/2, 1/4, 1/5, 2/5, 4/5$ using materials to support

Year 5 Measurement						
Calculate and compare the area of squares and rectangles including using standard units, square Centimetres and square metres and estimate the area of irregular shapes	Estimate volume (e.g. Using 1 cm cubed blocks to build cubes and cuboids) and capacity (e.g. using water)	Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	Solve problems involving converting between units of time	Convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints
Estimate the area of irregular composite shapes using knowledge of the area formula for identifiable parts	Know that capacity refers to a containing space and the room available to hold something	Refer to 'Working Mathematically' document	Begin to express missing measures algebraically, for example $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm	Refer to 'Working Mathematically' document	Use knowledge of place value and multiplication and division to convert between standard units in meaningful contexts	Know equivalences between metric and imperial measures
Calculate the area from scale drawings using given measurements e.g. scale drawing of a field	Understand that volume = length x width x height e.g. 4cm^3	Use knowledge of conversion between units and apply to problems	Begin to calculate missing measures to find the perimeter of composite rectilinear shapes			Know what imperial units measure and how they are used e.g. weighing scales, milk, men's clothes
Calculate the area of squares and rectangles using multiplication facts	Count the blocks in a cube or cuboid to identify volume		Show how the perimeter of two shapes changes when they become a composite shape			Identify imperial units in the world today
	Know that volume of a 3D shape is a measure of how much space is contained within or occupied by that shape		Understand what a composite shape is			

Year 5 Geometry – properties of shapes, position and direction						
Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	Draw given angles, and measure them in degrees	Identify: - angles at a point and one whole turn (total 360 degrees) - angles at a point on a straight line and 1/2 a turn (total 180 degrees) - other multiples of 90 degrees	Use the properties of rectangles to deduce related facts and find missing lengths and angles	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed
Identify 3D shapes from a 2D drawing	Know and identify what a reflex angle is	Draw reflex angles accurately with a ruler and protractor	Use angle sum facts and other properties to make deductions about missing angles	Use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals	Identify regular and irregular shapes from their properties	Be able to use co-ordinates to describe the position of the reflection
Identify 3D shapes from a physical model	Estimate acute and obtuse angles	Draw acute and obtuse angles accurately with a ruler & protractor				Be able to reflect a shape horizontally and vertically in the first quadrant
Revise names and properties of common 3-D shapes		Measure reflex angles				Describe a position after a translation using co-ordinates in the first quadrant
Consolidate properties of shapes from Year 4		Measure acute and obtuse angles				
		Ensure correct and accurate use of a protractor				

Year 5 Statistics	
Solve comparison, sum and difference problems using information presented in a line graph	Complete, read and interpret information in tables, including timetables
Compare two sets of data on separate graphs Compare two sets of data on one graph	Begin to decide which representations of data are most appropriate and why
Explore what makes a line graph and the type of data that can be shown	

Year 6 Number and Place Value			
Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit	Round any whole number to a required degree of accuracy	Use negative numbers in context, and calculate intervals across zero	Solve number and practical problems that involve the year 6 place value objectives
Order and compare numbers from 5 000 000 to 10 000 000	Determine the degree of accuracy depending on the context e.g. for medication, money etc	Find the difference between negative numbers e.g. what is the difference in temperature?	Refer to 'Working Mathematically' document
Read and write numbers from 5 000 000 to 10 000 000			
Order and compare numbers to 5 000 000			
Read and write numbers to 5 000 000			

Year 6 Number – Addition, Subtraction, Multiplication and Division (1)			
Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication	Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context	Perform mental calculations, including with mixed operations and large numbers
Consolidate multiplication from Year 5	Divide and show the remainder as a decimal	Divide and round remainders to a required degree of accuracy e.g. the nearest 10, 20, 50	Encourage derivation of new facts from those already known
	Divide and show the remainder as a fraction		Consolidate and ensure retention of earlier multiplication and division facts
	Divide and show the remainder as a whole number		
	Apply knowledge of place value and division to calculate using the formal written method of long division – link to chunking		
	Divide by a 2-digit number using an informal written method e.g. chunking		
	Consolidate division from Year 5		

Year 6 Number – Addition, Subtraction, Multiplication and Division (2)				
Identify common factors, common multiples and prime numbers	Use their knowledge of the order of operations to carry out calculations involving the four operations	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 estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
Understand the term 'common factor' and be able to identify them	Use BODMAS and all four operations	Refer to 'Working Mathematically' document	Refer to 'Working Mathematically' document	Identify whether to round up or down depending on the context of a problem
Understand the term 'common multiple' and be able to identify them	Explore how the order of operations changes the answer. Introduce brackets e.g. $2+1\times 3=5$ and $(2+1)\times 3=9$			Round up or down to a specified degree of accuracy e.g. 10, 20 or 50
Consolidate knowledge of multiples, factors and primes from Year 5				Apply estimation strategies to a range of problems

Year 6 Fractions including decimals and percentages (1)					
Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	Compare and order fractions, including fractions > 1	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]	Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]	Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
Identify common multiples shared by fractions		Use and understand the addition and subtraction of fractions with different denominators by identifying equivalent fractions with the same denominator	Use a variety of images to support understanding of multiplying with fractions (understand multiplication as fractions of)	Use images/ fraction walls to represent the division of proper fractions	Round a recurring decimal up to 3 decimal places
Use the language associated with fractions		Begin adding and subtracting with fractions where the denominator of one fraction is a multiple of another e.g. $\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$			Understand what a recurring decimal is

Year 6 Fractions including decimals and percentages (2)				
Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places	Multiply one-digit numbers with up to two decimal places by whole numbers	Use written division methods in cases where the answer has up to two decimal places	Solve problems which require answers to be rounded to specified degrees of accuracy	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
Consolidate multiplication and division by 10, 100 and 1000 from year 5	Use money, measures etc. to show the effect of multiplying a decimal number by a whole number	Begin to understand the division of a decimal number by one-digit whole numbers in practical contexts e.g. measures and money	Round the answer to a specified degree of accuracy and check the reasonableness of the answer	Use the understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (for example, if $\frac{1}{4}$ of a length is 36cm, then the whole length is $36 \times 4 = 144\text{cm}$)
	Use materials to explain the effect of multiplying numbers with two decimal places by whole numbers	Use materials to explain the effect of dividing numbers with two decimal places by whole numbers	Estimate to predict and to check order of magnitude of answer	Link knowledge of converting between decimals, fractions and percentages and apply to different contexts

Year 6 Ratio and 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
Use known facts to calculate quantities e.g. 200g of sugar is needed for 1 cake, how much is needed for 6 cakes?	Link percentages or 360° to calculating angles of pie charts	Use ratio to compare quantities, sizes and scale drawings	Consolidate understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. Begin to use the notation a:b to record work
Recognise proportionality in contexts when the relations between quantities are in the same ratio (for example, similar shapes and recipes)	Combine known percentages to calculate other percentage amounts e.g. find 65%	Understand what ratio means e.g. ratio of 1:3 means split into 4 parts	Solve problems involving unequal quantities e.g. For every egg you need 3 spoonful's of flour. How many eggs would you need if you used 27 spoons of flour?
	Find 10%, 50%, 5% and 1% of an amount	Understand what proportion means	

Year 6 Algebra				
Use simple formulae	Generate and describe linear number sequences	Express missing number problems algebraically	Find pairs of numbers that satisfy an equation with two unknowns	Enumerate possibilities of combinations of two variables
Use formulae for mathematical areas already known e.g. area and perimeter	Generate a linear number sequence	Use algebra to represent numbers, lengths, angles, coordinates etc	Understand that there can be more than one answer when there are two unknowns in an equation	Begin to generalise the number of possibilities e.g. $x + y = 100$ There will be z possible combinations because...
Use symbols and letters to represent variables and unknowns in problem solving contexts	Use letters and symbols to describe any term in a given sequence (nth term)	Express missing numbers using symbols/letters e.g. What would you add to 4 to get 10? This can be shown as $x + 4 = 10$	Find a number that satisfies an equation with one unknown e.g. $x + y = 7$, if $x = 2$ what is y ?	Identify all possible answers and combinations to an equation
Use symbols and letters to represent variables and unknowns in calculation contexts	Use contexts to support the generation and description of linear number sequences e.g. growing patterns			Use knowledge of number and the four operations to identify possible answers e.g. $x + y = 7$, x and y could be 6 and 1, 2 and 5, 3 and 4
	Understand the term 'linear'			

Year 6 Measurement						
Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate	Use, read, write and convert between standard units, converting 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	Convert between miles and kilometres	Recognise that shapes with the same areas can have different perimeters and vice versa	Recognise when it is possible to use formulae for area and volume of shapes	Calculate the area of parallelograms and triangles	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].
Know approximate conversions and be able to tell if an answer is sensible	Apply previous knowledge of conversion and the 4 operations to convert between smaller and larger units	Connect conversion (for example, from kilometres to miles) to a graphical representation	Explore the relationship between area and perimeter – can they ever be the same? When are they different? If possible generalise	Use formulae to calculate volume of a shape (height x width x length)	Use and apply the formula for area to calculate the area of a range of parallelograms and triangles	Apply strategies for estimation to estimating volume
Use the number line to add and subtract positive and negative integers for measures such as temperature.				Consolidate understanding from year 5	Calculate the area of a parallelogram by splitting the shape into a rectangle and two right angle triangles	Compare the volume of cubes and cuboids in practical contexts
Refer to 'Working Mathematically' document					Find the area of an equilateral triangle	
					Find the area of a right angled triangle using knowledge of rectangles	

Year 6 Geometry						
Draw 2-D shapes using given dimensions and angles	Recognise, describe and build simple 3-D shapes, including making nets	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	Describe positions on the full coordinate grid (all four quadrants)	Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Use conventional markings for lines and angles	Draw nets accurately using measuring tools e.g. ruler, protractor	Explain how unknown angles and lengths can be derived from known measurements	Understand how to use a pair of compasses	Investigate and know that angles that are vertically opposite are equal	Apply knowledge of one quadrant to all four quadrants, including the use of negative numbers	Draw and label rectangles (inc. squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using their properties
Draw 2D shapes accurately using measuring tools e.g. ruler, protractor	Describe nets of 3D shapes	Investigate and know the interior angles of triangles, quadrilaterals and regular polygons	Investigate and know the diameter (d) of a circle which could be expressed as $d=2r$	Find missing angles on a straight line when given supplementary angles		Draw and label a coordinate grid with equal scaling including the use of negative numbers
	Recognise the nets of 3D shapes	Identify a range of ways to classify shapes e.g. symmetry, number of sides, parallel lines, perpendicular lines (use a decision tree to classify)	Investigate and know what the radius of a circle is (r)			
	Build 3D shapes using Polydron, Lego etc.					
	Deconstruct 3D shapes found in the environment					

Year 6 Statistics	
Interpret and construct pie charts and line graphs and use these to solve problems	Calculate and interpret the mean as an average.
Connect work on angles, fractions and percentages to the interpretation of pie charts	Know when it is appropriate to find the mean of a data set
Construct pie charts using knowledge of angles and a pair of compasses	Know what the term 'mean' is
Encounter and draw graphs relating two variables, arising from pupils' own enquiry and in other subjects	
Connect conversion from kilometres to miles in measurement to its graphical representation	
Interpret line graphs	
Construct line graphs arising from pupils' own enquiry	

Key Learning Objectives	Fluency & Problem Solving		Communicating		Reasoning		
	Problem Solving	Finding Possibilities	Representing	Explaining	Looking For Patterns	Predicting	
	<ul style="list-style-type: none"> use mathematics as an integral part of classroom activities with support 		<ul style="list-style-type: none"> represent their work with objects or pictures discuss their work, e.g. with support 		<ul style="list-style-type: none"> draw simple conclusions from their work, e.g. with support recognise and use a simple pattern or relationship, e.g. with support 		
Lower Key Stage 1	↑	independently make simple connections and use prior knowledge to solve practical problems	find several possibilities	use pictures to help explain what has been done	explain what has been done by talking about it using mathematical language	create a pattern of objects or numbers and begin to explain it	explain numbers and calculations, how many altogether, how many used or hidden, how many left, how many each, etc.
	↑	with support, make connections & use prior knowledge to solve similar practical problems	Find more than 1 possibility	with some support, draw pictures to show outcomes	with prompts, explain what has been done using some mathematical language	recognise a simple pattern of objects/shapes and continue it	predict what comes next in a simple sequence
	↑	use objects to help solve practical problems		with support, use objects to show how to solve a problem	refer to the materials they have used and talk about what they have done, patterns they have noticed, etc.	identify which set has most, which object is biggest, smallest, tallest, etc.	
	↑	engage with practical mathematical activities involving sorting, counting and measuring by direct comparison			respond to questions about their work using some mathematical words	recognise a simple pattern of objects/shapes and recreate it	
	↑	begin to understand the relevance of mathematical ideas to everyday situations by using them in role play				describe the different ways they have sorted objects, what is the same about objects in a set, how sets differ	
	↑					copy and continue a simple pattern of objects, shapes or numbers	
	↑						

Upper Key Stage 1	Key Learning Objectives	Fluency & Problem Solving		Communicating		Reasoning	
		Problem Solving	Finding Possibilities	Representing	Explaining	Looking For Patterns	Predicting
	<ul style="list-style-type: none"> try different approaches to solve a problem. select the mathematics they use in some classroom activities with support e.g. 			<ul style="list-style-type: none"> discuss their work using mathematical language, e.g. with support begin to represent their work using symbols and simple diagrams, e.g. with support 		<ul style="list-style-type: none"> explain why an answer is correct, e.g. with support predict what comes next in a simple number, shape or spatial pattern or sequence and give reasons for their opinions 	
↑	independently use prior mathematical knowledge to solve problems	adopt a suggested model or systematic approach	begin to independently use and interpret diagrams and symbols	engage with others' explanations, compare... evaluate...	confidently use patterns in new contexts	test a statement such as, 'The number twelve ends with a 2 so 12 sweets can be shared equally by 2 children'	
↑	make connections and apply their knowledge to similar situations	find all possibilities using a system	with support, use simple diagrams to represent work	without prompting, can put a problem into their own words and explain how it was solved	begin to use patterns in new contexts	respond to questions such as 'What if...?' and 'What could you do next?'	
↑	begin to independently transfer mathematical knowledge and use it to solve problems	find lots of possibilities, with some understanding of a system	where appropriate, begin to use symbols to represent work	when prompted, can restate a problem in their own words and explain how it was solved	use patterns in familiar contexts	confidently make predictions and test these with examples	
↑	move between different representations of a problem e.g. a situation described in words, a diagram etc.	find lots of possibilities	use pictures, to communicate their thinking, or demonstrate a solution or process	explain what has been done using a wider range of mathematical language		make predictions and test these with examples	
↑	with support, identify the mathematical knowledge needed to solve practical problems		begin to appreciate the need to record and develop their own methods of recording				
↑	use apparatus, diagrams, role play, etc. to represent and clarify a problem						
↑	find a starting point, identifying key facts/relevant information						

Lower Key Stage 2	Learning Objectives	Fluency & Problem Solving		Communicating		Reasoning		
		Problem Solving	Word Problems	Representing	Explaining	Looking For Patterns And Generalising	Predicting	
	↑	<ul style="list-style-type: none"> try different approaches and find ways of overcoming difficulties that arise when they are solving problems select the mathematics they use in a range of classroom activities 		<ul style="list-style-type: none"> begin to organise their work and check results discuss their mathematical work and begin to explain their thinking use and interpret mathematical symbols and diagrams 		<ul style="list-style-type: none"> understand a general statement by finding particular examples that match it review their work and reasoning 		
	↑	persevere with mathematics by using different approaches to overcome difficulties	begin to solve 2-step problems involving money, measure, +, -, x and ÷	begin to interpret mathematical symbols and diagrams independently and solve problems systematically	use their working out to help them explain how they solved a problem	independently can generalise simple rules that fit the patterns in mathematics	begin to make some simple general statements and suggest extensions	
	↑	begin to try a variety of approaches to overcome difficulties when solving problems	confidently solve 1-step problems involving money, measure +, -, x and ÷	with support interpret mathematical symbols and diagrams and solve problems systematically	begin to ask questions to clarify a problem and explain what has been done	be able to independently recognise patterns to solve simple mathematical problems and puzzles	respond to questions such as 'What if...?' and 'What could you do next?'	
	↑	begin to look for patterns in results and use them to find other possible outcomes	begin to solve 1-step problems involving money, measure +, -, x and ÷	use diagrams & symbols to solve problems and explain what has been done in writing	without prompting, can put a problem into their own words and explain how it was solved	begin to make some simple general statements of their own	confidently make predictions and test these with examples	
	↑	with support identify different approaches that can be used to solve a problem	Choose to use appropriate calculation strategies including a calculator	develop an organised approach as they get into recording their work on a problem	talk about their findings by referring to their written work	find examples that satisfy simple general statements	when a problem has been solved, pose a similar problem for a partner	
	↑	check work and make appropriate corrections, e.g. decide that two numbers less than 100 cannot give a total >200		begin to develop own ways of recording	use appropriate mathematical vocabulary	make a generalisation with the assistance of probing questions and prompts		
	↑	use mathematical content from Years 2,3,4 and 5 to solve problems and investigate			put the problem into their own words	respond to 'What if?' questions		
↑	use discussion to break into a problem, recognising similarities to previous work							
↑	choose equipment appropriate to the task							

		Fluency & Problem Solving	Communicating	Reasoning
Upper Key Stage 2	Key Learning Objectives	<ul style="list-style-type: none"> identify and obtain necessary information to carry through a task and solve mathematical problems check results, considering whether these are reasonable solve word problems and investigations from a range of contexts 	<ul style="list-style-type: none"> show understanding of situations by describing them mathematically using symbols, words and diagrams 	<ul style="list-style-type: none"> draw simple conclusions of their own and give an explanation of their reasoning
		Problem Solving	Proving	Concluding, Generalising & Justifying
	↑	With increasing independence, persevere with longer and more complex problems, using a range of strategies	Present and interpret solutions in the context of problems, being precise in the use of language, notation and diagrams	Begin to justify simple mathematical statements by drawing upon previous knowledge
	↑	To carry through tasks and solve problems, identify and obtain necessary information to solve problems and check their results considering whether these are sensible	Show understanding of situations by describing them mathematically using symbols, words and diagrams e.g. Use a diagram to show that the perimeter of a rectangle is unchanged when a square corner is removed 	Try to search for patterns or reasons why things work out as they do e.g. "How can you get from one square number to the next?" "Is there a pattern?"
	↑	Independently, solve problems by breaking down complex calculations into simpler steps	Tabulate findings systematically	Draw simple conclusions of their own and give an explanation of their reasoning
	↑	Choose and use operations and calculation strategies appropriate to the numbers and context	Make choices when presenting something and justify why method is effective	Begin to draw simple conclusions of their own and give an explanation of their reasoning
	↑	Break down more complex problems, with support, into simpler steps before attempting a solution	Begin to tabulate systematically	Can use mathematical language and notation to create a general statement in writing
	↑	recognise information that is important to solving the problem, determine what is missing and develop lines of enquiry	begin to understand and use formulae and symbols to represent problems	explain and justify their methods and solution
	↑	consider efficient methods, relating problems to previous experiences	Refine ways of recording using notation, diagrams and symbols correctly	identify more complex patterns, making generalisations in words and begin to express generalisations using symbolic notation
↑	<i>check as they work, spotting and correcting errors and reviewing methods</i>	Organise their work from the outset, looking for ways to record systematically	use examples and counter-examples to justify conclusions	
↑	use mathematical content from Years 5, 6 and 7 to solve problems and investigate	Decide how best to represent conclusions, using appropriate recording		