Lowbrook Academy

Whole School

Maths Long Term Overview

Curriculum Maps

for

Progress in Understanding Mathematics

Termly content for Early Years – Foundation Stage

- **Bold** statements are Early Learning Goals for the end of the Foundation Stage/Reception.
- We anticipate that the material shown in regular, non-bold text is introduced, as appropriate, from the Autumn term, and reinforced and developed in subsequent terms.

Reception	Across the year leading to Summer term
Number, place value and rounding	• count actions or objects that cannot be moved • count an irregular arrangement of up to twenty objects • estimate how many objects they can see and check by counting them • use the language of more or fewer to compare sets • **count reliably with numbers from 1 to 20, place them in order and say which number is one more or less than a given number**
Four operations	• find the total number of items in two groups by counting all of them • begin to use the vocabulary involved in adding and subtracting • record using marks that they can interpret and explain • **use quantities or objects to add and subtract 2 single digit numbers and count on or back to find the answer** • begin to identify own mathematical problems based on own interests and fascinations • explore and solve problems in a range of practical and play contexts utilising own methods • make two equal groups of objects and check they are equal by counting • **solve problems, including doubling, halving and sharing**
Measures	• order two or three items by length or height • order two items by weight or capacity • order and sequences familiar events • measure short period of time in simple ways • **use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems**
Geometry	• describe their position such as behind or next to • use familiar objects and common shapes to create and recreate patterns and build models • notice patterns in the environment • make patterns using a range of media and resources • **recognise, create and describe patterns** • use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes • select a particular named shape • recognise and name common shapes in the environment • **explore characteristics of everyday objects and shapes and use mathematical language to describe them**

Lowbrook Maths Curriculum Long and Medium Term Planning

Curriculum Maps

for

Progress in Understanding Mathematics

Termly content for Year 1

- Blue highlighting denotes specific material moved down from a higher year.
- Yellow highlighting denotes content not explicit in the PNS for the year, to help you transfer from your existing lesson planning.
- **Purple text** denotes repeated statements.
- *Italics* indicate illustrative examples, non-statutory notes and guidance from the new PoS. (NB most of the non-statutory notes and guidance are new, from a higher year, or beyond the PNS.)

Year 1	Autumn	Spring	Summer
NUMBER			
Place value and rounding	• Count to 100, forwards and backwards, beginning with 0 or 1, or from any given number *e.g. 19, 18, 17, 16, …* • Count, read and write numbers to 100 in numerals, count in multiples of twos and tens *e.g. 2, 4, 6, 8, 10, 12, …* • Given a number, identify one more and one less • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • Read and write numbers from 1 to 20 in numerals • *Use language of ordering e.g. first, second, third*	• 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, fives and tens *e.g. 22, 24, 26, 28, 30, … or 90, 80, 70, 60, …* • Given a number, identify one more and one less • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • Read and write numbers from 1 to 20 in numerals and words. • *Use language of ordering e.g. first, second, third* • *Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100 supported by objects and pictorial representations* • *Begin to order numbers to 100 (different tens) e.g. order 36, 29, 63, 51*	• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number *e.g. 103, 102, 101, 100, 99, 98, …* • Count, read and write numbers to 100 in numerals, count in multiples of twos, fives and tens *e.g. 5, 10, 15, 20, 25, …* • Given a number, identify one more and one less • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • Read and write numbers from 1 to 20 in numerals and words. • *Use language of ordering e.g. first, second, third* • *Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100 supported by objects and pictorial representations* • *Begin to order numbers to 100 (different tens)* • *Recognise odd and even numbers*

Addition and subtraction	• Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • Represent, *memorise* and use number bonds and related subtraction facts *within 10, in several forms e.g. 3 + 4 = 7; 4 = 7 – 3;* • Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero • Solve simple one-step problems *(in familiar practical contexts, including using quantities)* that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems *e.g. 3 + □ = 7* • *Problems should include vocabulary such as: put together, add, altogether, total, take away, more than, less than…*	• Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • Represent, *memorise* and use number bonds and related subtraction facts *within 10, in several forms, and begin to know doubles to 20 e.g. 8 + 8 = 16 complements to 20 e.g. 8 + 12 = 20* • Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero • Solve simple one-step problems *(in familiar practical contexts, including using quantities)* that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems • *Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than…*	• Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • Represent, *memorise* and use number bonds and related subtraction facts within 20, *in several forms e.g. 9 + 7 = 16;* *16 – 7 = 9; 7 = 16 - 9* • Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero • Solve simple one-step problems *(in familiar practical contexts, including using quantities)* that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems *e.g. 7 = □ - 9* • *Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than…*
Multiplication and division	• *Double and halve numbers to 20 e.g. double 6 is 12, half of 10 is 5*	• *Double and halve numbers to 20 e.g. double 8 is 16, half of 20 is 10*	• *Double and halve numbers to 20* • 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 *e.g. share 8 sweets between 2 children*

Fractions	• Recognise, find and name a half as one of two equal parts of an object, shape, *length* or quantity *e.g. Find half of a length of string, by folding;*.	• Recognise, find and name a half as one of two equal parts of an object, shape, length or quantity *e.g. What is half of 12 counters?* • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity *e.g. find a quarter of a shape, by folding in half and half again*	• Recognise, find and name a half as one of two equal parts of an object, shape, length or quantity • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity *e.g. find ¼ of 12 beads, practically*
MEASUREMENT			
Measurement	• Compare, describe and solve practical problems for: ○ lengths and heights *(e.g. long/short, longer/shorter, tall/short, double/half)* ○ mass or weight *(e.g. heavy/light, heavier than, lighter than)* ○ capacity/volume *(full/empty, more than, less than)* ○ time *(quicker, slower, earlier, later)* • *Use non standard measures to* measure and begin to record the following: ○ lengths and heights ○ mass/weight ○ capacity and volume • Recognise and know the value of different denominations of coins	• Compare, describe and solve practical problems for: ○ lengths and heights *(e.g. long/short, longer/shorter, tall/short, double/half)* ○ mass or weight *(e.g. heavy/light, heavier than, lighter than)* ○ capacity/volume *(full/empty, more than, less than, quarter)* ○ time *(quicker, slower, earlier, later)* • *Begin to use measuring tools (ruler, weighing scales, containers) to* measure and begin to record the following: ○ lengths and heights ○ mass/weight ○ capacity and volume ○ time (hours, minutes) • Recognise and know the value of different denominations of coins and notes • Sequence events in chronological order	• Compare, describe and solve practical problems for: ○ lengths and heights *(e.g. long/short, longer/shorter, tall/short, double/half)* ○ mass or weight *(e.g. heavy/light, heavier than, lighter than)* ○ capacity/volume *(full/empty, more than, less than, quarter)* ○ time *(quicker, slower, earlier, later)* • *Begin to use standard measures (metres, cms, grams/kg, litres) to* measure and begin to record the following: ○ lengths and heights ○ mass/weight ○ capacity and volume ○ time (hours, minutes, seconds) • Recognise and know the value of different denominations of coins and notes • Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening

	• Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening • Recognise and use language relating to dates, including days of the week, weeks, months and years • Tell the time to the hour and draw the hands on a clock face to show these times.	using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening • Recognise and use language relating to dates, including days of the week, weeks, months and years • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	• 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.
GEOMETRY			
Properties of shapes	• 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).*	• Recognise and name common 2-D and 3-D shapes, *in different orientations and sizes*, including: ○ 2-D shapes *(e.g. rectangles (including squares), circles and triangles)* ○ 3-D shapes *(e.g. cuboids, including cubes, pyramids and spheres).* • *know that rectangles, triangles, cuboids and pyramids can be different shapes*	• Recognise and name common 2-D and 3-D shapes, *in different orientations and sizes,* including: ○ 2-D shapes *(e.g. rectangles (including squares), circles and triangles)* ○ 3-D shapes *(e.g. cuboids (including cubes), pyramids and spheres).* • *know that rectangles, triangles, cuboids and pyramids can be different shapes*
Position and direction	• *Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down,*	• *Describe positions, directions and movements using language such as 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*	• *Describe positions, directions and movements using language such as 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…*

	forwards and backwards, inside and outside…	*outside…* • Describe position, directions and movements, including half and quarter turns, *in a clockwise direction*	• Describe position, directions and movements, including half, quarter and three-quarter turns, *in a clockwise direction*

Lowbrook Maths Curriculum Long and Medium Term Planning

Curriculum Maps

for

Progress in Understanding Mathematics

Termly content for Year 2

- Blue highlighting denotes specific material moved down from a higher year.
- Yellow highlighting denotes content not explicit in the PNS for the year, to help you transfer from your existing lesson planning.
- **Purple text** denotes repeated statements.
- *Italics* indicate illustrative examples, non-statutory notes and guidance from the new PoS. (NB most of the non-statutory notes and guidance are new, from a higher year, or beyond the PNS.)

Year 2	Autumn	Spring	Summer
NUMBER			
Number and place value	• count in steps of 2 and 5 from 0, and tens from any number, forward or backward *e.g. 93, 83, 73, 63, …* • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including the number line • read and begin to write numbers to at least 100 in numerals and in words *e.g. forty* • compare and order numbers from 0 up to 100 • use place value and number facts to solve problems	• count in steps of 2, 3, and 5 from 0, and tens from any number, forward or backward • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including the number line • read and write numbers to at least 100 in numerals and in words *e.g. forty-five* • compare and order numbers from 0 up to 100; use <, > and = signs • use place value and number facts to solve problems. • *partition numbers in different ways e.g. 23 = 20 + 3 = 10 + 13*	• count in steps of 2, 3, and 5 from 0, and tens from any number, forward or backward • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including the number line • read and write numbers to at least 100 in numerals and in words • compare and order numbers from 0 up to 100; use <, > and = signs • use place value and number facts to solve problems. • *partition numbers in different ways e.g. 23 = 20 + 3 = 10 + 13*
Addition and subtraction	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ○ a two-digit number and ones ○ a two-digit number and tens *e.g. 87 – 30 = 57*	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ○ a two-digit number and ones ○ a two-digit number and tens ○ two two-digit numbers *e.g. 34+29*	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ○ a two-digit number and ones ○ a two-digit number and tens ○ two two-digit numbers *e.g. 63-29*

	• 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
	
	• begin to recall and use addition and subtraction facts to 20, *e.g. 19 – 7 = 12* and derive and use related facts up to 100
	• *e.g. 30 = 90 – 60*
	
	• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.
	
	• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
		○ adding three one-digit numbers *e.g. 6 + 5 + 4*
		
		• 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
		
		• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
		
		• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.
		
		• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
		
		• *use the language 'sum' and 'difference' e.g. find two numbers with a difference of 6 (3 and 9, 10 and 16..);*
			○ adding three one-digit numbers *e.g. 9 + 7 + 9*
			
			• 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
			
			• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
			
			• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.
			
			• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
			
			• *use the language 'sum' and 'difference' e.g. three numbers sum to 12, two numbers are 3 and 7, what is the third number?*

Multiplication and division	• begin to recall and use multiplication and division facts for the 2, and 10 multiplication tables, including recognising odd and even numbers *e.g. 22 ÷ 2 = 11* • 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 by another cannot • *recognise and use the inverse relationship between multiplication and division in calculations* • *relate multiplication and division to grouping and sharing discrete(e.g. counters and continuous quantities e.g. water* • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts *e.g. share 18 counters between 3 children*	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, 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 by another cannot • *recognise and use the inverse relationship between multiplication and division in calculations* • *relate multiplication and division to grouping and sharing discrete e.g. counters and continuous quantities e.g. water, and relating these to fractions and measures e.g. 40cm ÷ 2 = 20cm; 20cm is ½ of 40cm* • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, 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 by another cannot • *recognise and use the inverse relationship between multiplication and division in calculations* • *relate multiplication and division to grouping and sharing discrete e.g. counters and continuous quantities e.g. water, and relating these to fractions and measures e.g. 40cm ÷ 2 = 20cm; 20cm is ½ of 40cm* • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts *e.g. there are 10 pencils in a box, I have 5 boxes and 3 spare pencils, how many do I have altogether?*

Fractions	• recognise, name and write fractions $^1/_3$, $^1/_4$, 2/4 and ¾ of a shape	• recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity *e.g. how long is $^1/_3$ of a ribbon which is 60 cm long?* • write simple fractions e.g. ½ of 6 = 3 and recognise the equivalence of two quarters and one half. • *count in fractions e.g. 0, ½, 1, 1½, 2, 2½, …*	• recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity • write simple fractions e.g. 1/2 of 6 = 3 and recognise the equivalence of two quarters and one half. • *count in fractions e.g. 3¼, $3^2/_4$, 3¾, 4, 4¼, …*
MEASUREMENT			
Measurement	• choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm) to the nearest appropriate unit, using rulers • compare and order lengths and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins to equal the same amounts of money • *e.g. find different ways to make 25p* • solve simple problems in a practical context involving addition and subtraction of money of the same unit	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); **mass** (kg/g) to the nearest appropriate unit, using rulers, scales • compare and order lengths, masses and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins to equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit including giving change e.g. *I buy 2*	• 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, masses, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value *e.g. make 73p using the fewest coins* • find different combinations of coins to equal the same amounts of money

	including giving change e.g. *I buy a toy for £14; how much change do I get from £20?* • compare and sequence intervals of time • tell and write the time quarter past/to the hour and draw the hands on a clock face to show these times *e.g. draw the hands on a clock face to show ¼ to 6, making sure the hour hand is located correctly*	*bags of sweets for 20p each, how much change will I get from 50p?* • 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.	• solve simple problems in a practical context involving addition and subtraction of money of the same unit including giving change e.g. *I buy a cake for 60p and a biscuit for 25p, how much change will I get from £1?* • 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.
GEOMETRY			
Properties of shapes	• identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line • *draw lines and shapes using a straight edge* • identify and describe the properties of 3-D shapes, including the number of vertices and faces • compare and sort common 2-D and 3-D shapes and everyday objects • *e.g. sort 3-D shapes in different ways such as whether they have triangular faces, all straight edges…*	• identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line • *draw lines and shapes using a straight edge* • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • compare and sort common 2-D and 3-D shapes and everyday objects *e.g. sort 3-D shapes in different ways such as whether they are prisms, whether they have more than 8 edges…*	• identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line • *draw lines and shapes using a straight edge* • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • compare and sort common 2-D and 3-D shapes and everyday objects *e.g. sort 2-D shapes in different ways such as whether they are quadrilaterals and have line symmetry….*

	• *recognise and name, polygons e.g. pentagon, hexagon, octagon and cones*	• *recognise and name quadrilaterals, polygons e.g. pentagon, hexagon, octagon, prisms and cones* • identify 2-D shapes on the surface of 3-D shapes, for example a circle on a cylinder and a triangle on a pyramid	• *recognise and name quadrilaterals, polygons e.g. pentagon, hexagon, octagon, prisms and cones* • identify 2-D shapes on the surface of 3-D shapes, for example a circle on a cylinder and a triangle on a pyramid
Position and direction	• order and arrange combinations of mathematical objects in patterns, *including those in different orientations e.g. a turning shape, draw the next shape in the pattern* 	• order and arrange combinations of mathematical objects in patterns, *including those in different orientations* • use mathematical vocabulary to describe position, direction and movement, including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise), and movement in a straight line. • *Use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (e.g. pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles)*	• order and arrange combinations of mathematical objects in patterns, *including those in different orientations* • use mathematical vocabulary to describe position, direction and movement, including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise), and movement in a straight line. • *Use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (e.g. pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles)*
STATISTICS			
Use and interpret data	• interpret and begin to construct simple pictograms, tally charts, block diagrams and simple tables	• interpret and construct simple pictograms *e.g. where the symbol represents 2, 5 or 10 units,* tally charts,	• interpret and construct simple pictograms *e.g. where the symbol represents 2, 5 or 10 units,* tally charts,

	• answer simple questions by counting the number of objects in each category and sorting the categories by quantity • answer questions about totalling and comparing categorical data.	block diagrams and simple tables • answer simple questions by counting the number of objects in each category and sorting the categories by quantity • answer questions about totalling and comparing categorical data.	block diagrams and simple tables • answer simple questions by counting the number of objects in each category and sorting the categories by quantity • answer questions about totalling and comparing categorical data.

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Progress in Understanding Mathematics

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Year 3	Autumn	Spring	Summer
NUMBER			
Number and place value	• Count from 0 in multiples of 4, 50 and 100; find 10 or 100 more or less than a given number *e.g. 10 more than 395* • Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • Identify, represent and estimate numbers using different representations *including those related to measure e.g. using place value cards to show 985 = 900 + 80 + 5; tally marks; base 10 apparatus.* • *Apply partitioning related to place value using varied and increasingly complex problems e.g. 146 = 100 and 40 and 6, 146 = 130 and 16* • Read and write numbers to at least 1000 in numerals • Compare and order numbers up to 1000 • Solve number problems and practical problems involving place value and rounding.	• 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) • Identify, represent and estimate numbers using different representations *including those related to measure* • *Apply partitioning related to place value using varied and increasingly complex problems* • Read and write numbers to at least 1000 in numerals and in words *e.g. three hundred and forty-six* • Compare and order numbers up to 1000 • Solve number problems and practical problems involving place value and rounding	• 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) • Identify, represent and estimate numbers using different representations *including those related to measure* • *Apply partitioning related to place value using varied and increasingly complex problems* • Read and write numbers to at least 1000 in numerals and in words • Compare and order numbers up to 1000 • Solve number problems and practical problems involving place value and rounding
Addition and subtraction	• Add and subtract numbers mentally, including: ○ a three-digit number and ones ○ a three-digit number and tens ○ a three-digit number and hundreds *e.g. 858 – 300* ○ *two-digit numbers where the*	• Add and subtract numbers mentally, including: ○ a three-digit number and ones ○ a three-digit number and tens *e.g. 476 + 50* ○ a three-digit number and hundreds.	• Add and subtract numbers mentally, including: ○ a three-digit number and ones ○ a three-digit number and tens *e.g. 824 – 30* ○ a three-digit number and hundreds

	answer could exceed 100 e.g. 99+18 • Add and subtract numbers with up to three digits • Estimate the answer to a calculation and use inverse operations to check answers *e.g. 702 – 249 is approximately 700 – 250 = 450; check 453 + 249 = 702* • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction *e.g. investigate the numbers which could go in the boxes when* *2 ×* ☐ *7 +* ☐	○ *two-digit numbers where the answer could exceed 100* • Add and subtract numbers with up to three digits, using formal written methods of columnar addition • 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 *e.g. There are 46 boys and 58 girls in Year 3, but 12 children are away; how many Year 3 children are at school?*	○ *two-digit numbers where the answer could exceed 100 e.g. 68+47* • Add and subtract numbers with up to three digits, using the efficient 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 *e.g. investigate the numbers which could go in the boxes when* ☐ 3 = 2 ☐ ☐ 6
Multiplication and division	• Recall and use multiplication and division facts for the 3 and 4 multiplication tables • *Develop efficient mental methods, for example, using commutativity e.g. 2 × 7 × 5 = 2 × 5 × 7 = 10 × 7 = 70 and multiplication and division facts to derive related facts e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3 to derive 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3* • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • *Develop efficient mental methods, for example, using commutativity and multiplication and division facts to derive related facts* • 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	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • *Develop efficient mental methods, for example, using commutativity e.g. 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240 and multiplication and division facts to derive related facts* • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers

	know including for two-digit numbers times one-digit numbers, using mental methods *e.g. 22×3* • Solve problems, including missing number problems, involving multiplication and division *e.g. 90 = 3 ×* □	and progressing to formal written methods *e.g. 34×5 or 64÷4* • Solve problems, including missing number problems, involving multiplication and division *e.g. 240 = × 4*	times one-digit numbers, using mental and progressing to formal written methods *e.g. 46×8 or 81÷3* • Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems *(e.g. change a recipe for 2 people to make enough for 6 people)* and correspondence problems in which n objects are connected to m objects. *e.g. 3 hats and 4 coats, how many different outfits? Or Share 6 cakes equally between 4 children.*
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 *e.g. 3 cakes shared between 10 children gives $^{3}/_{10}$ each.* • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators *e.g. find $^{1}/_{3}$ of 9 beads, then $^{2}/_{3}$ of 9 beads* • *understand the relation between unit fractions as operators (fractions of), and division by integers e.g. to find $^{1}/_{3}$, you divide by 3; to find $^{1}/_{5}$, you divide by 5* • Recognise and use fractions as numbers *on the number line*: unit fractions and non-unit fractions with small	• 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 • *Connect tenths to place value, decimal measures and to division by 10 e.g. $^{7}/_{10}$ = 0.7* • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators *e.g. there are 8 marbles and three of them are red; what fraction of the marbles are red?* • *Understand the relation between unit fractions as operators (fractions of), and division by integers e.g. to find $^{1}/_{3}$, you divide by 3; to find $^{1}/_{5}$, you divide by 5*	• 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 • *Connect tenths to place value and decimal measures (not restricted to decimals between 0 and 1) and to division by 10 e.g. $^{13}/_{10}$ = 1.3* • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators *e.g. find $^{4}/_{5}$ of 30* • *Understand the relation between unit fractions as operators (fractions of), and division by integers e.g. to find $^{1}/_{3}$, you divide by 3; to find $^{1}/_{5}$, you divide by 5* • Recognise and use fractions as numbers

	denominators • Recognise and show, using diagrams, equivalent fractions with small denominators *e.g.* ½ = $^3/_6$  • Solve problems that involve fractions *e.g. Amy ate ¼ of her 12 sweets and Ben ate ½ of his 8 sweets, who ate more sweets?*	• Recognise and use fractions as numbers *on the number line:* unit fractions and non-unit fractions with small denominators • Recognise and show, using diagrams, equivalent fractions with small denominators • Compare and order unit fractions, and fractions with the same denominators *e.g. put in order* $^3/_8$, $^1/_8$, $^7/_8$, $^5/_8$ • Solve problems that involve fractions	*on the number line:* 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 *e.g. If* $^1/_3$ *of a cake is eaten then* $^2/_3$ *remains or* $^5/_7 + ^1/_7 = ^6/_7$ • Compare and order unit fractions, and fractions with the same denominators *e.g. put in order* $^1/_2$, $^1/_8$, $^1/_4$, $^1/_6$ • Solve problems that involve fractions *e.g. Ali, Ben and Cara have 24 fish.* $^2/_3$ *of them belong to Ali, ¼ belong to Ben and the rest belong to Cara; how many fish belong to Cara?*
MEASUREMENT			
Measurement	• Measure, compare, add and subtract: **length** (m/cm/mm) *e.g. how much ribbon is left when 36cm is cut from 1m? Which is longer: 6½cm or 62mm? 5m or 450cm? Measure and draw lines to the nearest ½ cm. Know the approximate length of a book, a room, a handspan…* • Add and subtract amounts of money to give change, using both £ and p in practical contexts *e.g. I buy2 packs of sweets for 75p*	• Measure, compare, add and subtract: length (m/cm/mm) **mass** (kg/g) *e.g. find 3 vegetables which weigh between 100g and 300g. Read 250g on a scale labelled every 100g. Which is heavier: 1kg 300g or 1½kg? Know the approximate mass of a book, an apple, a baby, a man…* • Add and subtract amounts of money to give change, using both £ and p in	• measure, compare, add and subtract: length (m/cm/mm); mass (kg/g); **volume/capacity** (l/ml) *e.g. Read 300ml on a scale labelled every 200ml. Order a set of containers by capacity, using a measuring jug and water to check. Know the approximate capacity of a cup, a jug, a bucket…* • measure the perimeter of simple 2-D shapes *e.g. measure accurately the sides*

	each; how much change will I get from £2? • Tell and write the time from an analogue clock *e.g. draw hands on a clock face to show 'ten to four', making sure the hour hand is located correctly* • 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 • Compare durations of events, for example to calculate the time taken by particular events or tasks.	practical contexts *e.g. I have a £2 coin, two £1 coins, three 50p coins, a 20p and seven 5p coins; how much more do I need to make £10?* • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour *digital* 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 • Compare durations of events, for example to calculate the time taken by particular events or tasks. • Know the number of seconds in a minute and the number of days in each month, year and leap year	*of a triangle in cm or mm, in order to find the perimeter* • add and subtract amounts of money to give change, using both £ and p in practical contexts *e.g. Ali is saving 80p each week, to buy a toy costing £5; how many weeks will it take him?* • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour *digital* 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 • Compare durations of events, for example to calculate the time taken by particular events or tasks. • Know the number of seconds in a minute and the number of days in each month, year and leap year
GEOMETRY			
Properties of shapes	• Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations; and describe them *e.g. number of faces, edges and vertices (singular: vertex), e.g. guess my*	• Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations; and describe them	• Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations; and describe them

	shape: it has a square face and four triangular faces (square-based pyramid)	• Recognise that angles are a property of shape or a description of 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 • *Describe the properties of shapes using accurate language, including symmetrical/not symmetrical, lengths of lines, and acute and obtuse angles e.g. sort triangles into those with an obtuse angle and those without*	• Recognise that angles are a property of shape or a description of 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 • *Describe the properties of shapes using accurate language, including symmetrical/not symmetrical, lengths of lines, and acute and obtuse angles* • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
STATISTICS			
Use and interpret data	• Interpret and present data using bar charts, pictograms and tables, *understanding and using simple scales e.g. 2, 5, 10 units per cm with increasing accuracy.* • Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables. • *Interpret data presented in many contexts*	• Interpret and present data using bar charts, pictograms and tables, *understanding and using simple scales e.g. 2, 5, 10 units per cm with increasing accuracy.* • Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables. • *Interpret data presented in many contexts*	• Interpret and present data using bar charts, pictograms and tables, *understanding and using simple scales e.g. 2, 5, 10 units per cm with increasing accuracy.* • Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables. • *Interpret data presented in many contexts*

Lowbrook Maths Curriculum Long and Medium Term Planning

Curriculum Maps

for

Progress in Understanding Mathematics

Termly content for Year 4

- Blue highlighting denotes specific material moved down from a higher year.
- Yellow highlighting denotes content not explicit in the PNS for the year, to help you transfer from your existing lesson planning.
- **Purple text** denotes repeated statements.
- *Italics* indicate illustrative examples, non-statutory notes and guidance from the new PoS. (NB most of the non-statutory notes and guidance are new, from a higher year, or beyond the PNS.)

Year 4	Autumn	Spring	Summer
NUMBER			
Number and place value	• Count in multiples of 6, 9, 25 and 1000 *e.g. 625, 600, 575, 550, 525, 500, …* • Find 1000 more or less than a given number *e.g. 45 + 1000, 8904 – 1000* • 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 *including measures and measuring instruments* • Round any number to the nearest 10 or 100 • Solve number and practical problems that involve place value and rounding and with increasingly large positive numbers	• 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 *e.g. 8, 6, 4, 2, 0, -2, -4, -6,…* • 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 *including measures and measuring instruments* • Round any number to the nearest 10 or 100 • Solve number and practical problems that involve place value and rounding and with increasingly large positive numbers	• 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 *including measures and measuring instruments* • Round any number to the nearest 10, 100 or 1000 • Solve number and practical problems that involve place value and rounding and 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. *e.g. 49 = XLIX*
Addition and subtraction	• *Use both mental and written methods with increasingly large numbers to aid*	• *Use both mental and written methods with increasingly large numbers to aid*	• *Use both mental and written methods with increasingly large numbers to aid*

	fluency e.g. mentally calculate 540 + 400 or 900 – 360 • 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 *e.g. 8702 – 499 is approximately 9000 – 500 = 8500; check 8203 + 499 = 8702* • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why *e.g. It costs £3.50 for Ben to go swimming and £5:70 for his mum; how much change is there from £10?*	*fluency* • 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 *e.g. investigate which amounts of money cannot be made using exactly three coins*.	*fluency e.g. mentally calculate 540 + 270 or 900 – 365* • 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 *e.g. Mr Smith sets out on a 619 mile journey; he drives 320 miles before lunch and 185 miles after lunch; how much farther does he need to drive?*
Multiplication and division	• Recall multiplication and division facts for multiplication tables up to 10 × 10 • 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 *e.g. 600 ÷ 3 = 200; 4 × 6 × 2* • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout *(see appendix)* • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one	• 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 *e.g. 420 = 70 × 6; 5 × 4 × 9* • Recognise and use factor pairs and commutativity in mental calculations *e.g. factor pairs of 20 are 1 and 20, 2 and 10, 4 and 5; addition and multiplication are commutative e.g. 2×6×5=2×5×6=10×6* • Multiply two-digit and three-digit	• 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 *e.g. 640 ÷ 8 = 80; 4 × 6 × 20* • 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

	digit *e.g.34 × 6 = (30 ×6) + (4 × 6)*, integer scaling problems and harder correspondence problems such as n objects are connected to m objects *e.g. 3 skirts and 4 tops, how many different outfits?*	numbers by a one-digit number using formal written layout • *Use the formal written method for short division with exact answers when dividing by a one-digit number e.g. 456 ÷ 3* • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit *e.g.34 × 6 = (30 ×6) + (4 × 6)*, integer scaling problems and harder correspondence problems such as n objects are connected to m objects *e.g. the number of different choices on a menu*	• *Use the formal written method for short division with exact answers when dividing by a one-digit number e.g. 736 ÷ 8* • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit *e.g.34 × 6 = (30 ×6) + (4 × 6),* integer scaling problems and harder correspondence problems such as n objects are connected to m objects *e.g. 3 cakes shared equally between 10 children*.
Fractions (including decimals)	• *Know that decimals and fractions are different ways of expressing proportions* • Recognise and show, using diagrams, families of common equivalent fractions • *Count using simple fractions and decimal fractions, both forwards and backwards e.g. $4^1/_3, 4^2/_3, 5, 5^1/_3, 5^2/_3, 6, 6^1/3$; 3.2, 3.1, 3, 2.9, 2.8, … and represent fractions and decimals on a number line* • Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten *e.g. $^3/_{10} = {}^{30}/_{100} = 0.30 = 0.3$*	• *Know that decimals and fractions are different ways of expressing proportions* • Recognise and show, using diagrams, families of common equivalent fractions • *Count using simple fractions and decimal fractions, both forwards and backwards and represent fractions and decimals on a number line* • Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten • Identify, name and write equivalent fractions of a given fraction, including	• *Know that decimals and fractions are different ways of expressing proportions* • Recognise and show, using diagrams, families of common equivalent fractions • *Count using simple fractions and decimal fractions, both forwards and backwards and represent fractions and decimals on a number line* • Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten • Identify, name and write equivalent fractions of a given fraction, including

	• Identify, name and write equivalent fractions of a given fraction, including tenths and hundredths *e.g.* $^{6}/_{9} = {}^{2}/_{3}$ • Solve problems to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number *e.g. find* $^{4}/_{9}$ *of 18 counters* • Recognise and write decimal equivalents of any number of tenths or hundredths *e.g.* $^{9}/_{10} = 0.9$; $^{9}/_{100} = 0.09$ • Recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$ • 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 units, tenths and hundredths	tenths and hundredths • Solve problems to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number *e.g. What fraction of a day is 3 hours?* • Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$ • 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 units, tenths and hundredths • Round decimals with one decimal place to the nearest whole number *e.g. 32.5 rounds to 33; 49.7 rounds to 50* • Compare numbers with the same number of decimal places up to two decimal places *e.g. put in order: 2.56, 26.52, 2.65, 25.62, 2.62* • Solve simple measure and money problems involving fractions and decimals to two decimal places. *e.g. two parcels weigh 5.5kg altogether, one weighs 3.8kg, what is the mass of the other?*	tenths and hundredths • Add and subtract fractions with the same denominator *e.g.* $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5}$ • 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 *e.g.* $^{1}/_{5}$ *of is 9* • Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$ • 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 units, 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 *e.g. Ben buys a toy costing £4.55 and ¼ kg of sweets costing £3.20 per kilo; how much change does he receive from £10?*

MEASUREMENT			
Measurement	• Convert between different units of measure *(e.g. kilometre to metre; hour to minute) e.g. 4½kg = 4500g;* • Estimate, compare and calculate different measures, including money in pounds and pence *e.g. put in order: £1.20, 98p, £0.89, £1.08*	• Convert between different units of measure *(e.g. kilometre to metre; hour to minute) e.g. 90 minutes = 1½ hours* • 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 *e.g. ¼ to 8 in the evening can be written as 19:45* • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. e.*g. which of these children are 3 years old:* ○ *Isabel 39 months* ○ *Ben 32 months* ○ *Cara 50 months* ○ *Dylan 42 months*	• Convert between different units of measure *(e.g. kilometre to metre; hour to minute)* • Estimate, compare and calculate different measures, including money in pounds and pence *e.g. put in order: 4.2kg, 4700g, 4½kg, 490g* • 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. • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres *e.g. find the perimeter of an L-shape where the lengths are given or can be measured* • Find the area of rectilinear shapes by counting squares *e.g. find the area of an L-shape drawn on squared paper*
GEOMETRY			
Properties of shapes	• Compare and classify geometric shapes, including quadrilaterals *(e.g. parallelogram, rhombus, trapezium)* and triangles *(e.g. isosceles, equilateral, scalene),* based on their properties and sizes *e.g. sort triangles to find those that*	• Compare and classify geometric shapes, including quadrilaterals *(e.g. parallelogram, rhombus, trapezium)* and triangles *(e.g. isosceles, equilateral, scalene),* based on their properties and sizes *e.g. sort quadrilaterals to find those*	• Compare and classify geometric shapes, including quadrilaterals *(e.g. parallelogram, rhombus, trapezium)* and triangles *(e.g. isosceles, equilateral, scalene),* based on their properties and sizes

	are isosceles and/or have a right angle • Complete a simple symmetric figure with respect to a specific line of symmetry	*with line symmetry or parallel edges* • Complete a simple symmetric figure with respect to a specific line of symmetry • Identify acute and obtuse angles and compare and order angles up to two right angles by size, *without using a protractor*	• Complete a simple symmetric figure with respect to a specific line of symmetry. • Identify acute and obtuse angles and compare and order angles up to two right angles by size, *without using a protractor* • *Compare lengths and angles to decide if a polygon is regular or irregular. e.g. regular polygons have edges with the same lengths and angles all the same size e.g. a square is the only regular quadrilateral* • Identify lines of symmetry in 2-D shapes presented in different orientations
Position and direction	• Describe positions on a 2-D grid as coordinates in the first quadrant • Plot specified points and draw sides to complete a given polygon. *e.g. find the coordinates of the missing vertex of a shape.*	• Describe positions on a 2-D grid as coordinates in the first quadrant • Plot specified points and draw sides to complete a given polygon. • Describe movements between positions as translations of a given unit to the left/right and up/down	• describe positions on a 2-D grid as coordinates in the first quadrant • Plot specified points and draw sides to complete a given polygon. • Describe movements between positions as translations of a given unit to the left/right and up/down
STATISTICS			
Use and interpret data	• Interpret and present discrete data using appropriate graphical methods, including bar charts, *using a greater range of scales* • Solve comparison, sum and difference	• Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs, *using a greater range of scales e.g. height of a sunflower plant, measured daily for 2 weeks*	• Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs, *using a greater range of scales*

	problems using information presented in bar charts, pictograms, tables and other graphs	• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

Lowbrook Maths Curriculum Long and Medium Term Planning

Curriculum Maps

for

Progress in Understanding Mathematics

Termly content for Year 5

- Blue highlighting denotes specific material moved down from a higher year.
- Yellow highlighting denotes content not explicit in the PNS for the year, to help you transfer from your existing lesson planning.
- **Purple text** denotes repeated statements.
- *Italics* indicate illustrative examples, non-statutory notes and guidance from the new PoS. (NB most of the non-statutory notes and guidance are new, from a higher year, or beyond the PNS.)
-

Year 5	Autumn	Spring	Summer
NUMBER			
Number and place value	• Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit *e.g. order a set of multi-digit numbers from smallest to largest - 37 700, 737 570, 737 507, 37 570* • Count forwards or backwards in steps of powers of 10 from any given number up to 1 000 000 *e.g. 197 000, 198 000, 199 000, 200 000, 201 000…* • Round any number up to 1 000 000 to the nearest 10, 100 and 1000 e.g. *265 946 to the nearest 1000 (266 000)* • Solve number problems and practical problems that involve number, place value and rounding e.*g. What number is halfway between 560 500 and 560 600?*	• Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit e.g. what is the smallest integer you can make using all of these digits: 8, 1, 0, 5, 6? • Count forwards or backwards in steps of powers of 10 from any given number up to 1 000 000 • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero *e.g. count back in threes: 8, 5, 2, -1, -4, -7…* • 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 that involve number, place value and rounding *e.g. What is the largest 4-digit number whose digits sum to 20? (9920).* • *Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule e.g. find the rule and complete the sequence: ___, 16, 8, 4, ___, 1, 0.5, ___ (rule is: halve*	• Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit *e.g. What must be added to 37 500 to change it to 67 500?* • Count forwards or backwards in steps of powers of 10 from any given number up to 1 000 000 • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers 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 that involve number, place value and rounding. *e.g. The distance to the bus stop is 1km to the nearest 100m; what is the shortest distance it could be?* • *Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule e.g. find the rule and complete the sequence: ___, 16, 8, 4, ___, 1, 0.5, ___* • Read Roman numerals to 1000 (M)

		previous number)	and recognise years written in Roman numerals. e.*g. MCMXIV (1914)*
Addition and subtraction	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers *e.g. 15 400 – 2000 = 13 400* • Use 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 *e.g. I have read 124 of the* 526 *pages of my book; how many more pages must I read to reach the middle?*	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers • Use 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 *e.g. I bought some stickers on Monday; on Tuesday I bought 20 more than I bought on Monday; now I have 70; how many stickers did I buy on Monday?*	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers *e.g. 12 462 – 2 300 = 10 162* • Use 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 *e.g. Write a number story for this number sentence: 3709=4562+234-1087*
Multiplication and division	• *Continue to practise and apply multiplication tables and related division facts, committing them to memory and using them confidently to make larger calculations* • Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers	• *Continue to practise and apply multiplication tables and related division facts, committing them to memory and using them confidently to make larger calculations* • Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers	• *Continue to practise and apply multiplication tables and related division facts, committing them to memory and using them confidently to make larger calculations* • 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 and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • Multiply and divide numbers mentally drawing upon known facts *e.g. 60×9* • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 *e.g. 456÷100=4.56* • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign *e.g. 40×8=500 -* ☐	• Know and use the vocabulary of prime numbers and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • Multiply and divide numbers mentally drawing upon known facts *e.g. 630÷9* • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • 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 *e.g. 98 ÷ 4 = 24 r 2 = 24½ = 24.5 ≈ 25.* • Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning	• Solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors *e.g. 828÷36 = (828÷4)÷9 = 207÷9 = 23* • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers *e.g. prime factors of 60=2×2×3×5* • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • Multiply and divide numbers mentally drawing upon known facts *e.g. 840÷12* • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • 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 • Recognise and use square numbers

		of the equals sign *e.g. There are 6 shelves of books; 3 shelves hold 35 books each, one shelf holds 45 books and the top two shelves have the same number of books on each; there are 200 books altogether; how many books are on the very top shelf?*	and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) • 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.*eg a toymaker can make 8 toys in 2 hours; how many toys can he make in 5 hours?*
Fractions (including decimals and percentages)	• *Know that percentages, decimals and fractions are different ways of expressing proportions* • *Count forwards and backwards in fractions and decimals bridging zero* • Compare and order fractions whose denominators are all multiples of the same number *e.g. put these fractions in order from the smallest: $^5/_{12}$, $^5/_6$, $^{11}/_{12}$, $^2/_3$* • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths *making links to decimals and measures e.g. $^{37}/_{100}$ metre = 0.37m*	• *Know that percentages, decimals and fractions are different ways of expressing proportions* • *Count forwards and backwards in fractions and decimals bridging zero* • Compare and order fractions whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths *making links to decimals and measures* • *Connect fractions >1 to division with remainders e.g. $^5/_4 = 5 \div 4 = 1^1/_4$*	• *Know that percentages, decimals and fractions are different ways of expressing proportions* • *Count forwards and backwards in fractions and decimals bridging zero* • Compare and order fractions whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths *and extending to thousandths, making links to decimals and measures e.g. $^{755}/_{1000}$ kg = 0.755kg* • *Connect fractions >1 to division with*

	• Read and write decimal numbers as fractions *e.g. 0.71 = 71/100* • *Mentally add and subtract:* ○ *tenths e.g. 0.8 - 0.3* ○ *one-digit whole numbers and tenths e.g. 3.4 + 2.6* ○ *complements of 1 e.g. 0.85 + 0.15 = 1* • 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 hundred, and as a decimal fraction *e.g. 43% = $^{43}/_{100}$ = 0.43* • *Recognise that percentages are proportions of quantities e.g. 40% of the class are boys; what percentage are girls? as well as operators on quantities e.g. find 40% of 30 children.*	• Recognise mixed numbers and improper fractions and convert from one form to the other *e.g. 5 $^{2}/_{3}$ = $^{17}/_{3}$* and write mathematical statements >1 as a mixed number e.g. $^{2}/_{5}$ + $^{4}/_{5}$ = $^{6}/_{5}$ = $1^{1}/_{5}$ • Add and subtract fractions with the same denominator and multiples of the same number e.g. $^{2}/_{3}$ + $^{1}/_{6}$ = $^{5}/_{6}$ • *Find fractions of numbers and quantities e.g. $^{3}/_{4}$ of £14* • *Connect multiplication by a fraction to using fractions as operators e.g. $^{2}/_{3}$ of 12 = 12 × $^{2}/_{3}$* • Read and write decimal numbers as fractions • *Mentally add and subtract:* ○ *tenths e.g. 0.8 + 0.9* ○ *one-digit whole numbers and tenths e.g. 3.1 – 2.9* ○ *complements of 1 e.g. 0.83 + 0.17 = 1* • *Add and subtract decimals with a different number of decimal places e.g. 102.3 + 97.82* • Round decimals with two decimal places to the nearest whole number and to one decimal place *e.g. 27.59=27.6 (1d.p.)*	*remainders e.g. $^{37}/_{5}$ = 37÷5=7 $^{2}/_{5}$* • Recognise mixed numbers and improper fractions and convert from one form to the other *e.g. 5 $^{2}/_{3}$ = $^{17}/_{3}$* and write mathematical statements >1 as a mixed number • Add and subtract fractions with the same denominator and multiples of the same number e.g. $^{2}/_{5}$ + $^{7}/_{10}$ = $^{11}/_{10}$ = $1^{1}/_{10}$ • *Find fractions of numbers and quantities e.g. $^{7}/_{8}$ of 240ml* • *Connect multiplication by a fraction to using fractions as operators e.g. $^{8}/_{5}$ of 40 = 40 × $^{8}/_{5}$* • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. *e.g. use egg boxes to represent $2^{5}/_{6}$ × 3 = $6^{15}/_{6}$= $8^{3}/_{6}$= $8^{1}/_{2}$* • Read and write decimal numbers as fractions *e.g. 0.8=$^{4}/_{5}$* • *Mentally add and subtract:* ○ *tenths e.g. 0.8 + 0.9 – 0.2* ○ *one-digit whole numbers and tenths e.g. 7.4 – 6.6* ○ *complements of 1 e.g. 0.83 + 0.17 = 1*

		• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents *e.g.* $^{650}/_{1000} = {}^{65}/_{100} = 0.65$; • Read, write, order and compare numbers with up to three decimal places *e.g. put these decimals in order starting from the smallest: 0.457, 0.42, 0.46, 0.426* • Solve problems *and puzzles* involving number up to three decimal places, *checking the reasonableness of answers* • 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 hundred, and as a decimal fraction • *Recognise that percentages are proportions of quantities as well as operators on quantities* • 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.*e.g.* $^{12}/_{20} = {}^{60}/_{100} = 0.6 = 60\%$	• *Add and subtract decimals with a different number of decimal places e.g. 98.4 – 9.7* • Round decimals with two decimal places to the nearest whole number and to one decimal place • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents *e.g.* $^{782}/_{1000} = {}^{7}/_{10} + {}^{8}/_{100} + {}^{2}/_{1000}$ • Read, write, order and compare numbers with up to three decimal places *e.g. put these decimals in order starting from the smallest: 0.471, 0.46, 0.4, 0.465, 0.5* • Solve problems *and puzzles* involving number up to three decimal places, *checking the reasonableness of answers* • 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 hundred, and as a decimal fraction • *Recognise that percentages are proportions of quantities e.g. 30% voted 'yes', 45% voted 'no' and the rest did not vote; what percentage did not vote? as well as operators on*

			quantities e.g. find 45% of 160 • 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. *e.g. John ate $^4/_5$ of a 20cm jelly snake; Jane ate 0.7 of her 20cm jelly snake; how much more has John eaten?*
MEASUREMENT	• Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) *e.g. 15.7cm = 157mm* • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres *e.g. find the perimeter of an L shape where one or two side lengths are not given* • Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes • Use all four operations to solve problems involving measure *(e.g. length, mass, volume, money)* using decimal notation including scaling	• Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) *e.g. 3.7 litres = 3700ml* • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres *e.g. given the perimeter and length of a rectangle, calculate its width,w, expressing it algebraically e.g. 20 = (2×7) + 2w* • Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes • Estimate volume *e.g. using $1cm^3$ blocks to build cubes and cuboids* and capacity *e.g. using water*	• Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) *e.g. 2.2m = 2200mm* • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes *e.g. investigate possible rectangles with the same area as a particular square* • Estimate volume *e.g. using $1cm^3$ blocks to build cubes and cuboids* and capacity *e.g. using water* • Solve problems involving converting between units of time *e.g. three*

		• Solve problems involving converting between units of time *e.g. write these lengths of time in order, starting with the smallest: 250sec, 90min, ½ hour, 4min* • Use all four operations to solve problems involving measure *(e.g. length, mass, volume, money)* using decimal notation including scaling	*children share a trophy for 8 weeks and 4 days; they each have it for the same length of time; how long does each child keep the trophy?* • Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling • *Calculate the area of scale drawings using given measurements. e.g. calculate the area of a 5cm × 3cm garden on a scale drawing with a scale 1cm:2m (60m^2)* • Understand and use equivalences between metric and common imperial units such as inches, pounds and pints *e.g. Given that an inch is approximately 2.5cm, calculate the metric equivalent of a foot (12 inches)*
GEOMETRY			
Properties of shapes	• Identify 3-D shapes, including cubes and other cuboids, from 2-D representations *e.g. using isometric paper* • *Draw lines accurately to the nearest millimetre and use conventional markings for parallel lines and right angles.* • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	• Identify 3-D shapes, including cubes and other cuboids, from 2-D representations • *Draw lines accurately to the nearest millimetre and use conventional markings for parallel lines and right angles.* • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • Draw given angles, and measure	• Identify 3-D shapes, including cubes and other cuboids, from 2-D representations • *Draw lines accurately to the nearest millimetre and use conventional markings for parallel lines and right angles.* • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • Draw given angles, and measure

	• Use the properties of rectangles to deduce related facts and find missing lengths and angles *e.g. all angles are right angles, diagonals are congruent (same length) and bisect each other (divide into two equal parts), one diagonal separates the rectangle into two congruent triangles…*	them in degrees (°) • Identify: ○ angles at a point and one whole turn (total 360°) ○ angles at a point on a straight line and ½ a turn (total 180°) ○ other multiples of 90° • *Use angle sum facts and other properties to make deductions about missing angles* • Use the properties of rectangles to deduce related facts and find missing lengths and angles *e.g. all angles are right angles, diagonals are congruent (same length) and bisect each other (divide into two equal parts), one diagonal separates the rectangle into two congruent triangles…* • *Use the term diagonal and make conjectures about the angles formed by diagonals and sides, and other properties of quadrilaterals, e.g. using dynamic geometry ICT tools.*	them in degrees (°) • Identify: ○ angles at a point and one whole turn (total 360°) ○ angles at a point on a straight line and ½ a turn (total 180°) ○ other multiples of 90° • *Use angle sum facts and other properties to make deductions about missing angles* • Use the properties of rectangles to deduce related facts and find missing lengths and angles *e.g. all angles are right angles, diagonals are congruent (same length) and bisect each other (divide into two equal parts), one diagonal separates the rectangle into two congruent triangles…* • *Use the term diagonal and make conjectures about the angles formed by diagonals and sides, and other properties of quadrilaterals, e.g. using dynamic geometry ICT tools.* • Distinguish between regular and irregular polygons based on reasoning about equal sides and angles *e.g. sort triangles and quadrilaterals into regular and irregular sets, realising that only the equilateral triangles and the squares are regular*

Position and direction	• 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, 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, 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.
STATISTICS			
Use and interpret data	• Complete, read and interpret information in tables, including timetables.	• Complete, read and interpret information in tables, including timetables. • Solve comparison, sum and difference problems using information presented in a line graph *e.g. on a distance-time graph, how long did it take to travel a particular distance?* • *Connect work on coordinates and scales to their interpretation of time graphs*	• Complete, read and interpret information in tables, including timetables. • Solve comparison, sum and difference problems using information presented in line graphs • *Connect work on coordinates and scales to their interpretation of time graphs* • *Begin to decide which representations of data are most appropriate and why*

Lowbrook Maths Curriculum Long and Medium Term Planning

Curriculum Maps
for

Progress in Understanding Mathematics

Termly content for Year 6

- Blue highlighting denotes specific material moved down from a higher year.
- Yellow highlighting denotes content not explicit in the PNS for the year, to help you transfer from your existing lesson planning.
- **Purple text** denotes repeated statements.
- *Italics* indicate illustrative examples, non-statutory notes and guidance from the new PoS. (NB most of the non-statutory notes and guidance are new, from a higher year, or beyond the PNS.)

Y6 section	Autumn	Spring	Summer
NUMBER			
Number and place value	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit *e.g. What must be added to 26 523 to change it to 54 525?* • Round any whole number to a required degree of accuracy *e.g. round 265 496 to the nearest 10 000 (270 000)* • Solve number and practical problems that involve number, place value and rounding *e.g. What is the largest 5-digit number whose digits sum to 20? (99200)*.	• 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 *e.g. Give an example of a number which you might round to the nearest 10? Nearest 10 000?* • Use negative numbers in context, and calculate intervals across zero *e.g. how much warmer is 5°C than -4°C? (9°C)* • Solve number and practical problems that involve number, place value and rounding *e.g. What is the smallest number which rounds to 35 000, to the nearest 1000*? (34 500).	• 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 *e.g. What is the smallest number which rounds to 500 000, to the nearest 1000*? (499 500). • Use negative numbers in context, and calculate intervals across zero • Solve number and practical problems that involve number, place value and rounding *e.g. What is the smallest 4-digit integer whose digits sum to 20? (10199)*.
Addition, subtraction, multiplication and division	• *Continue to use all the multiplication tables to 12 × 12 in order to maintain their fluency e.g. 84÷12* • *Continue to practise the four operations for larger numbers using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division* • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of	• *Continue to use all the multiplication tables to 12 × 12 in order to maintain their fluency* • *Continue to practise the four operations for larger numbers using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division* • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of	• *Continue to use all the multiplication tables to 12 × 12 in order to maintain their fluency* • *Continue to practise the four operations for larger numbers using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division* • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of

	long multiplication • Perform mental calculations, including with mixed operations and large numbers *e.g. (13 500 × 2) ÷ 9 = 3000* • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. There are 6534 cars parked in a 3-storey car park; 1398 are on the first floor and 3765 are on the second floor; how many cars are parked on the third floor?* • Solve problems involving addition, subtraction, multiplication and division *e.g. 396 children and 37 adults went on a school trip; buses seat 57 people; how many buses were needed?* • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. e.*g. find the perimeter of a football pitch with side lengths 105.3m and 46.8m (estimate: (105+45)×2=300m; actual: (105.3+46.8)×2=304.2m (same number of decimal places as numbers in the question)* • Identify common factors, common multiples and prime numbers *e.g. common factors of 12 and 15 are 1 and 3; common multiples of 4 and 6 are 12,*	long multiplication • Perform mental calculations, including with mixed operations and large numbers • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. Three people won £365 496 on the lottery; one received £197 540, another received £40 010; how much did the third person receive?* • Solve problems involving addition, subtraction, multiplication and division *e.g. I think of a number and subtract 5.6 from it then multiply the result by 6; the answer is 7.2; what was my number?* • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy *e.g. A box contains approximately 52 matches; how many boxes can be filled with 10 000 matches?* • Identify common factors, common multiples and prime numbers *e.g. Find the smallest common multiple of 5, 6 and 8 (120)* • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and	long multiplication • Perform mental calculations, including with mixed operations and large numbers e.g. *(13 400 + 10 600) × 4 ÷ 12 = 8000* • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why *e.g. Write a number story for this number sentence: 23.5 = 20.4 + 4.9 - 1.8* • Solve problems involving addition, subtraction, multiplication and division *e.g. Club A sold 3500 tickets for £9.50 each and Club B sold 8150 tickets for £3.50; how much more money did Club A make than Club B?* • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy • Identify common factors, common multiples and prime numbers *e.g. Find the highest common factor of 120, 90 and 75 (15) or Find all the prime numbers between 80 and 100.* • 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

	24, 36…; prime numbers are numbers with exactly 2 factors e.g. 2, 3, 5, 7, 11, 13, …	interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Use their knowledge of the order of operations to carry out calculations involving the four operations *and using brackets; e.g. 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.*	remainders, fractions, or by rounding, as appropriate for the context • Use their knowledge of the order of operations to carry out calculations involving the four operations *and using brackets e.g. 14 x (29 – 12) + 7 = 245*
FRACTIONS			
Fractions (including decimals and percentages)	• Use common factors to simplify fractions *e.g. as the numerator and denominator have a common factor of 4, $^{12}/_{16}$ can be simplified to $^{3}/_{4}$*; use common multiples to express fractions in the same denomination *e.g. as the denominators have a common multiple of 12, $^{3}/_{4}$ and $^{5}/_{6}$ can both be expressed in twelfths i.e. $^{9}/_{12}$ and $^{10}/_{12}$ respectively* • *List equivalent fractions to identify fractions with common denominators* • Compare and order fractions, including fractions >1 *e.g. put these fractions in order from the smallest: $^{5}/_{4}$, $^{5}/_{8}$, $^{3}/_{2}$, $^{14}/_{8}$* • 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 *e.g. 205.6 ÷ 100 =2.056* • Multiply one-digit numbers with up to two decimal places by whole numbers	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • *List equivalent fractions to identify fractions with common denominators* • Compare and order fractions, including fractions >1 *e.g. put these fractions in order from the smallest: $^{5}/_{4}$, $^{5}/_{6}$, $^{3}/_{2}$, $^{4}/_{3}$* • Associate a fraction with division and calculate decimal fraction equivalents *e.g. 0.375* for a simple fraction *e.g. $^{5}/_{8}$* • *Use understanding of relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity e.g. if ¼ of a length is 36cm, then the whole length is 36 × 4 = 144cm* • Add and subtract fractions with	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • *List equivalent fractions to identify fractions with common denominators* • Compare and order fractions, including fractions >1 *e.g. put these fractions in order from the smallest: $^{5}/_{4}$, $^{5}/_{6}$, $^{3}/_{5}$, $^{4}/_{3}$* • Associate a fraction with division and calculate decimal fraction equivalents *e.g. 0.375* for a simple fraction *e.g. $^{5}/_{8}$* • *Use understanding of relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity e.g. if $^{1}/_{5}$ of a mass is 150g, then the whole mass is 150 × 5 = 750g* • Add and subtract fractions with

	e.g. 0.6 x 7 • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts *e.g. order $^{4}/_{5}$, 75%, 0.9, $^{19}/_{20}$*	different denominators and mixed numbers, using the concept of equivalent fractions *e.g. $^{1}/_{2} + {}^{1}/_{8} = {}^{5}/_{8}$* • 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 *e.g. □ × 100 = 140.8* • Multiply one-digit numbers with up to two decimal places by whole numbers *e.g. 0.06 x 8* • Use written division methods in cases where the answer has up to two decimal places *e.g. 458 ÷ 8 = 57.25* • *Multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers e.g. 3.15 × 62* • Solve problems which require answers to be rounded to specified degrees of accuracy *and check the reasonableness of answers*. • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. *e.g. find a fraction which lies between 0.4 and 0.5*	different denominators and mixed numbers, using the concept of equivalent fractions *e.g. $1^{3}/_{4} - {}^{5}/_{6} = {}^{11}/_{12}$* • *Use a variety of images to support understanding of multiplication with fractions* • Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. $¼ \times {}^{1}/_{2} = {}^{1}/_{8}$ • Divide proper fractions by whole numbers e.g. $^{1}/_{3} \div 2 = {}^{1}/_{6}$ • 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 *e.g. □ ÷ 1000 = 0.45* • Multiply one-digit numbers with up to two decimal places by whole numbers *e.g. 0.04 x 12* • Use written division methods in cases where the answer has up to two decimal places *e.g. 693 ÷ 15 = 14.2* • *Multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers e.g. 93.15 ÷ 5* • Solve problems which require answers to be rounded to specified degrees of accuracy *and check the reasonableness*

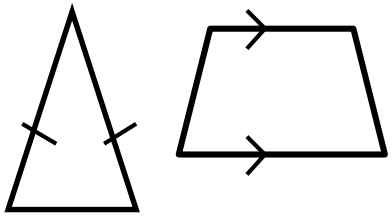
			of answers. • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts *e.g. find a decimal which lies between $^{3}/_{8}$ and ½*
Ratio and proportion	• Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts *e.g. adjust a recipe for 4 people, to serve 20 people*	• Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts *e.g. adjust a recipe for 4 people, to serve 6 people* • Solve problems involving similar shapes where the scale factor is known or can be found *e.g. two rectangular picture frames are the same shape, but one is bigger than the other; the smaller one measures 10cm by 15cm; the larger frame has a width of 30cm, what is its length?* • *Begin to use the notation a : b to record ratio* • Solve problems involving the calculation of percentages (e.g. measures) such as 15% of 360 and the use of percentages for comparison • *Link percentages of 360° to calculating angles of pie charts* • Solve problems involving unequal	• Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts *e.g. adjust a recipe for 6 people, to serve 15 people* • Solve problems involving similar shapes where the scale factor is known or can be found *e.g. On a map 2cm represents 1km; a road measures 7cm on the map, how long is it in real life?* • *Use the notation a : b to record ratio* • Solve problems involving the calculation of percentages (e.g. measures) such as 15% of 360 and the use of percentages for comparison • *Link percentages of 360° to calculating angles of pie charts* • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples *e.g. the ratio of boys to girls in class 6 is 1:2; there are 8 boys, how many girls are there?*.

		sharing and grouping using knowledge of fractions and multiples *e.g. for every egg you need three spoons of flour; how many eggs are needed for 12 spoons of flour?*	

Algebra	• *Use symbols and letters to represent variables and unknowns in mathematical situations…*
	  ○ *missing numbers, lengths, coordinates and angles e.g. 3x=24 or the angles in a triangle are 35°, 120° and y°; find y*
	  ○ *mathematics and science formulae e.g. A=l×w*
	  ○ *arithmetic rules e.g. a+b=b+a*
	• Express missing number problems algebraically *e.g. 17 = x + 4.5*
	• *U*se simple formulae expressed in words *e.g. write a formula for the number of months, m, in y years. (y=12m)*
	• Enumerate all possibilities of combinations of two variables *e.g. investigate how many different ways 2 red eggs can be placed in a 6-space egg carton, by starting with a 3-space carton, 4-space carton etc?*
		• *Use symbols and letters to represent variables and unknowns in mathematical situations…*
		  ○ *missing numbers, lengths, coordinates and angles e.g. 5y+1=16 or the angles in an isosceles triangle are 50°, y° and y°; find y*
		  ○ *mathematics and science formulae e.g. P=2(l+w)*
		  ○ *arithmetic rules e.g. a×b=b×a*
		  ○ *generalising number patterns e.g. 3, 6, 9, 12, … 3n*
		  ○ *number puzzles e.g. a+b=8.5 and a×6=15; find a and b*
		• Express missing number problems algebraically *e.g. the perimeter of a triangle is 20cm; it has two sides of length 8cm; what is the length of the other side? (20=2×8+x so x=4cm)*
		• Use simple formulae expressed in words *e.g. write a formula for the cost of a party, C, which costs £100 plus £2 per person, n. (C=100+2n)*
		• Enumerate all possibilities of combinations of two variables *e.g. investigate all possible half-time scores when the full time score of a football*
			• *Use symbols and letters to represent variables and unknowns in mathematical situations…*
			  ○ *missing numbers, lengths, coordinates and angles e.g. 68=6t-4 or the angles in a kite are x°, x°, 15° and 53°; find x, or plot points (x, y) where x+y=10*
			  ○ *mathematics and science formulae e.g. A=½(l×h)*
			  ○ *arithmetic rules*
			  ○ *generalising number patterns e.g. 6, 11, 16, 21, … 5n+1*
			  ○ *number puzzles e.g. x+y=10 and 2x+y=13; find x and y*
			• Express missing number problems algebraically *e.g. I'm thinking of a number; I double it and subtract 12 from the result; the answer is 60; what was my number? (2x-12=60, so 2x=72, so x=36)*
			• Use simple formulae expressed in words *e.g. write a formula for the cost of a taxi journey, C, which is £2.10 plus £1.60 per kilometre, k. (C=2.10+1.60k)*
			• Enumerate all possibilities of combinations of two variables *e.g. list all the combinations of boys and girls in*

		match is 4:2 • Generate and describe linear number sequences *e.g. write the first 5 terms in a 'decrease by 9' sequence starting from 20, or find the nth term of a simple sequence e.g. 4, 8, 12, 16, … 4n* • Find pairs of numbers that satisfy number sentences involving two unknowns. *e.g. a – b = 5, give pairs of values that a and b could have (e.g. 8, 3 or 6.5, 1.5 or …) or. p×q=24; if p and q are both positive, even numbers, list all the possible combinations (e.g. 2×12, 4×6, …)*	*a class where there are twice as many boys as girls and between 25 & 35 children in the class altogether.* • Generate and describe linear number sequences *e.g. 6, 13, 20, 27, … 7n-1* • Find pairs of numbers that satisfy number sentences involving two unknowns. *e.g. a – b = 5, give pairs of values that a and b could have (e.g. 8, 3 or 6.5, 1.5 or …)*
MEASUREMENT			
Measurement	• 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 three decimal places *e.g. 4.52kg = 4520g; 1.005km = 1005m* • Recognise that shapes with the same areas can have different perimeters and vice versa *e.g. investigate rectangles with areas of 24cm² to find which has the smallest perimeter* • Recognise when it is possible to use formulae for area of shapes *e.g. find the length of rectangle which is 4m*	• 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 three decimal places • Recognise that shapes with the same areas can have different perimeters and vice versa *e.g. investigate triangles with areas of 12cm² to find which has the smallest perimeter* • Recognise when it is possible to use formulae for area and volume of shapes *e.g. find the length of the side of a cube with a volume of 27cm³*	• 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 three decimal places • Recognise that shapes with the same areas can have different perimeters and vice versa *e.g. investigate parallelograms with areas of 24cm² to find which has the smallest perimeter* • Recognise when it is possible to use formulae for area and volume of shapes *e.g. find the height of cuboid which is 12cm long, 2cm high and has*

	wide and has the same area as a square with a side length of 8cm. • Calculate the area of triangles, *relating it to the area of rectangles, e.g. compare the 'counting squares' method to using the formula for the area of a triangle*	• Calculate the area of parallelograms and triangles, *relating it to the area of rectangles, e.g. compare the 'counting squares' method to using the formula for the area of a parallelogram* • Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate *e.g. Ben walked 850m to the bus stop, travelled on a bus for 8.67km and then a train for 120.9km; how far did he travel altogether?* • Convert between miles and kilometres *and other units commonly used e.g. know that a mile is approximately 1.6km (and 1km is approximately 0.6miles) and use this to make rough calculations* • 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.	*the same volume as a cube with sides of 6cm* • Calculate the area of parallelograms and triangles, *relating it to the area of rectangles* • Solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate *e.g. A jug holds 550ml; how may jugs of water are needed to fill a 4.8 litre bucket?* • convert between miles and kilometres *and other units commonly used e.g. use a conversion line graph or be able to work out that 6 pints of milk is a bit more than 3 litres* • 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. • *Begin to use compound units for speed e.g. miles per hour*
GEOMETRY			
Properties of shapes	• Draw 2-D shapes using given dimensions and angles *using measuring tools and conventional markings and*	• Draw 2-D shapes using given dimensions and angles *using measuring tools and conventional markings and*	• Draw 2-D shapes using given dimensions and angles *using measuring tools and conventional markings and*

	labels for lines and angles e.g. same length lines, parallel lines and same size angles:  • Recognise, describe and build simple 3-D shapes, including making nets *e.g. investigate different nets for a cube, recognising when 'nets' will fold to make a cube and when they will not.*	*labels for lines and angles e.g. complete a triangle with given lengths and angles* • Recognise, describe and build simple 3-D shapes, including making nets *e.g. visualise 3-D shapes drawn on isometric paper and begin to draw 2-D representations of 3-D shapes* • Compare and classify geometric shapes based on their properties and sizes (*e.g. parallel sides, line symmetry, types of angles etc)* and find unknown angles in any triangles, quadrilaterals, and regular polygons • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles *describing them algebraically e.g. a=180-(b+c)*.	*labels for lines and angles e.g. construct a triangle or complete a parallelogram with given lengths 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 • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles *describing them algebraically e.g. a=180-(b+c)* • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius *describing it algebraically as d=2×r*
Position and direction	• Describe positions on the full coordinate grid (all four quadrants) *e.g. (-3, 7)* • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. • *Predict missing coordinates of quadrilaterals by using the properties of shapes, which may be expressed*	• 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. • *Predict missing coordinates of quadrilaterals by using the properties of shapes, which may be expressed algebraically e.g. translating vertex (a,*	• 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. • *Predict missing coordinates of quadrilaterals by using the properties of shapes, which may be expressed algebraically e.g. translating vertex (a,*

	algebraically e.g. translating vertex (a, b) to (a-2, b+3), or find the other vertices of a square, given two of them are (a, b) and (a+d, b+d)	*b) to (a-2, b+3), or find the other vertices of a square, given two of them are (a, b) and (a+d, b+d)*	*b) to (a-2, b+3), or find the other vertices of a square, given two of them are (a, b) and (a+d, b+d)* • *Draw and label a pair of axes in all four quadrants with equal scaling.*
STATISTICS			
Use and interpret data	• Interpret and construct pie charts and line graphs and use these to solve problems *e.g. draw a pie chart to show how Jack spends his £36 birthday money:* ○ *£9 snacks* ○ *£15 toys* ○ *£12 books* • *Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects e.g. a scattergraph connecting heights of children and their long-jump distance*	• Calculate and interpret the mean as an average. *e.g. find the mean height of these children: 1.2m, 1.07m and 1.12m* • Interpret and construct pie charts and line graphs and use these to solve problems *e.g. create a conversion graph for pounds and Euros* • *Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.*	• Calculate and interpret the mean as an average. • Interpret and construct pie charts and line graphs and use these to solve problems *e.g. connect conversion from kilometres to miles in measure to its graphical representation.* • *Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.*