MATHEMATICS LONG TERM CURRICULUM OVERVIEW

Foundation Stage	Children at the expected level of development will: - Have a deep understanding of number to 10, including the composition of each number; - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. - Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

	Autumn 1		Autumn 2		Spring 1	Spring 2	Summer 1	Summer 2	
KS1 Cycle 1	Numbers & the Number System		Addition & Subtraction: Money & Real life problems		Multiplication & Division: Money & Real life problems	Geometry Symmetry, Area & Perimeter, FDP (shape)	Measures: Length, weight, capacity & time	Four operations	FDP (number)
KS1 Cycle 2	Numbers & the Number System		Addition & Subtraction: Money & Real life problems		Multiplication & Division: Money & Real life problems	Geometry Symmetry, Area & Perimeter, FDP (shape)	Measures: Length, weight, capacity & time	Four operations	FDP (number)
LKS2 Cycle 1	Numbers & the Number System	FDP	Addition & Subtraction: Money & Real life problems		Multiplication & Division: Money and Real life problems	Measures: Length, weight, capacity & time	Geometry	Four operations: Statistics, Data handling & Interpretation	
LKS2 Cycle 2	Numbers & the Number System	FDP	Addition & Subtraction: Money & Real life problems		Multiplication, Division, Money and Real life problems	Measures: Length, weight, capacity & time	Geometry	Four operations: Statistics, Data handling & Interpretation	
UKS2	Numbers & the	FDP	Four	Ratio &	Geometry	Measures: Length,	Algebra, statistics,	Place value & the	

Cycle 1	Number System		operations	proportion		weight, capacity. Perimeter & Area	FDP	number system
UKS2 Cycle 2	Numbers & the Number System	FDP	Four operations	Ratio & proportion	Geometry	Measures: Length, weight, capacity. Perimeter & Area	Algebra, statistics, FDP	Place value & the number system

> "The only way to learn mathematics is to DO mathematics."
>
> Paul Halmo

EYFS AUTUMN 1: Counting Properties of number and the number system.			
Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. ELG – Have a deep understanding of numbers to 10 including the composition of each number. ELG - Subitise up to 5. ELG – Compare quantities up to 10 in different contexts recognising when 1 quantity is greater than, less than or same as another quantity.			
Birth to 3 Years	3 – 4 Years	4 – 5 Years	Year 1 Expectations
Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence.	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').	Count objects, actions, and sounds. Counts out up to six objects from a larger group.	Identify and represent numbers using objects and pictorial representations including the number line.
	Recite numbers past 5.	Subitise up to 5 objects.	Read and write numerals to at least 100.
Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'.	Say one number for each item in order: 1,2,3,4,5.	Count beyond 10. (Verbally beyond 20)	Count to and across 100, forwards and backwards, beginning with 0 or 1 or from any given number.
Take part in finger rhymes with numbers.	Show 'finger numbers' up to 5.	Show 'finger numbers' up to 10.	Given a number, identify one more and one less

Compare amounts, saying 'lots', 'more' or 'same'.	Compare quantities using language 'more than, fewer than'.	Compare numbers – more, less than, fewer, same as, equal to.	Identify the bigger or smaller numbers in a given group of numerals or values. Use the language of; equal to, more than, less than (fewer), most, least, when ordering numbers or quantities, including money / measures.
	Begin to describe a sequence of events, real or fictional, using words such as first, then.	Estimating the amount	

EYFS AUTUMN 2 The Number System and Numerical Patterns
Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. ELG - Children will automatically recall number bonds to 5 and some to 10. ELG – Explore and represent patterns within numbers up to 10, including evens and odds. ELG - Compare quantities up to 10 in different contexts recognising when 1 quantity is greater than, less than or same as another quantity.

Birth to 3 Years	3 – 4 Years	4 – 5 Years	Year 1 Expected
Combine objects like stacking blocks and cups. Put objects inside others and take them out again.	Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').	Explore the composition of numbers up to 10. Provide a range of visual models of numbers. Plan games which involve partitioning and recombining sets.	Partition a teens number and larger two digit numbers into 10's and 1's and use this information to help order numbers.
Take part in finger rhymes with numbers.	Experiment with their own marks as well as numerals.	Develop an understanding of odd and even numbers.	Develop their understanding of patterns in the number system, for example odd and even numbers.
React to changes of amount in a group of up to three items.	Link numerals and amounts: eg., showing the right number of objects to match the numeral, up to 5.	Subitise up to 5 objects.	

	Talk about and identify the patterns around them. E.g. Stripes on clothes. Use informal language like spotty, blobs etc.	Link the number symbol (numerical) with its cardinal number value. Display numerals in order alongside dot quantities or tens frame arrangements.	Position numbers into a partially completed number line and track and use this information to identify the number before, after or in-between.
Notice patterns and arrange things in patterns.	Notice and correct an error in a repeating pattern. Understand position through words alone. e.g. the bag is under the table (no pointing)	Continue, copy, and create repeating patterns with varying rules.	Count in multiples of 2's, 5's and 10's, recognise the patterns that these sequences create on a 100 square, extend and fill in missing numbers.
	Extend and create ABAB patterns -stick, leaf, stick leaf	Counting in 2,5,10.	

EYFS SPRING 1 Addition

ELG - Automatically recall number bonds up to 5, including subtraction facts and some number bonds up to 10, the relationships between them and the patterns within those numbers including double facts.
ELG – Explore and represent patterns within numbers up to 10, including double facts.
ELG - Compare quantities up to 10 in different contexts recognising when 1 quantity is greater than, less than or the same as another quantity.

Birth to 3 Years	3 – 4 Years	4 – 5 Years	Year 1 Expected
Combine objects like stacking blocks and cups. Put objects inside others and take them out again.	Separate groups of objects to 5 in different ways, beginning to recognise that they are still the same.	Understand the 'one more than/one less than' relationship between consecutive numbers.	Count on and back in 2s. 5s and 10s.
Take part in finger rhymes with numbers. React to changes of amount in a group of up to three items. Compare amounts, saying 'lots', 'more' or 'same'.	Match numeral to quantity to 5.	Automatically recall number bonds for numbers 0-5 and some to 10.	Represent and use number bonds and related subtraction facts within 20. Memorise and reason with number bonds to 10 and 20.
Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'.	Find the total number of items in 2 groups by counting all of them.	To use the Malteser method to complete addition calculations.	Add and subtract one-digit and two-digit numbers to 20, including understanding the effect of adding or subtracting zero.
Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence.	In practical activities and discussions begin to use the vocabulary of addition.	Add two single digit numbers and count on to find the answer.	Pupils combine and increase numbers, counting forwards and backwards.
Climb and squeeze themselves into different types of spaces.	Realise that when one is added the number becomes larger.	Double facts, without rhymes.	
Build with a range of resources Complete inset puzzles Compare language – bigger/little/smaller, high/low, tall, heavy	Experiment with own symbols and marks as well as numerals.	Record and solve simple number sentences with numerals and pictures.	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.

EYFS – SPRING 2 –Subtraction

ELG - Automatically recall number bonds up to 5, including subtraction facts and some number bonds up to 10, the relationships between them and the patterns within those numbers including double facts.
ELG – Explore and represent patterns within numbers up to 10, including double facts.
ELG - Compare quantities up to 10 in different contexts recognising when 1 quantity is greater than, less than or the same as another quantity.

Birth to 3 Years	3 – 4 Years	4 – 5 Years	Year 1 Expected
Combine objects like stacking blocks and cups. Put objects inside others and take them out again. Take part in finger rhymes with numbers. React to changes of amount in a group of up to three items. Compare amounts, saying 'lots', 'more' or 'same'. Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'. Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence. Climb and squeeze themselves into different types of spaces. Build with a range of resources Complete inset puzzles Compare language – bigger/little/smaller, high/low, tall, heavy	Realise that when one is taken away the number becomes smaller.	Understand the 'one more than/one less than' relationship between consecutive numbers.	Count on and back in 2s. 5s and 10s.
	Separate groups of objects to 5 in different ways, beginning to recognise that they are still the same.	Automatically recall number bonds for numbers 0-5 and some to 10.	Represent and use number bonds and related subtraction facts within 20. Memorise and reason with number bonds to 10 and 20.
	In practical activities and discussions begin to use the vocabulary of addition.	To use the Malteser method to complete subtraction calculations.	Add and subtract one-digit and two-digit numbers to 20, including understanding the effect of adding or subtracting zero.
		Subtract two single digit numbers and count back to find the answer. Half facts, without rhymes.	Pupils combine and increase numbers, counting forwards and backwards.
	Experiment with your own symbols and marks as well as numerals.	Record and solve simple number sentences with numerals and pictures	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.

EYFS – SUMMER 1 Multiplication, Division and Problem Solving

ELG - Automatically recall number bonds up to 5, including subtraction facts and some number bonds up to 10, the relationships between them and the patterns within those numbers including double facts.
ELG – Explore and represent patterns within numbers up to 10, including double facts and how quantities can be distributed equally.

Birth to 3 Years	3 – 4 Years	4 – 5 Years	Year 1 Expected
Combine objects like stacking blocks and cups. Put objects inside others and take them out again. Take part in finger rhymes with numbers. React to changes of amount in a group of up to three items. Compare amounts, saying 'lots', 'more' or 'same'. Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'. Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence. Climb and squeeze themselves into different types of spaces. Build with a range of resources Complete inset puzzles Compare language – bigger/little/smaller, high/low, tall, heavy	Solve real world problems with numbers up to 5	Understand how quantities can be distributed equally.	Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; finding simple fractions of objects, numbers and quantities.
		Place Value to 20 (recognising teen numbers and what each numeral represents).	Make connections between arrays, number patterns and counting in twos, fives and tens.
		Automatically recall number bonds for numbers 0-5 and some to 10.	
		Solve practical problems that involve combining groups of 2, 10, 5, & 3's	Find the total number of items or coins are in two or more groups by counting groups in 2's, 5's and 10's and establishing a total or by sharing equally into sets and establishing how many objects are in each group.
		Solve practical problems that involve sharing equally.	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays.

EYFS – SUMMER 2 Shape, Space and Measures

Children will develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.

Birth to 3 Years	3 – 4 Years	4 – 5 Years	Year 1 Expected
Combine objects like stacking blocks and cups. Put objects inside others and take them out again. Take part in finger rhymes with numbers. React to changes of amount in a group of up to three items. Compare amounts, saying 'lots', 'more' or 'same'. Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'. Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence. Climb and squeeze themselves into different types of spaces. Build with a range of resources Complete inset puzzles Compare language – bigger/little/smaller, high/low, tall, heavy	Select shapes appropriately, flat surfaces for building, triangular prism for a roof etc.	Select, rotate, and manipulate shapes to develop spatial reasoning skills.	Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects.
	Talk about and explore 2D and 3D shapes using informal mathematical language side, corners, straight, flat, round. Combine shapes to make new ones – an arch, a bigger triangle etc.	To be able to copy increasingly complex 2D pictures and patterns with 3D resources. Compose and decompose shapes so that children recognise a shape can have other shapes in it.	Recognise and name common 2-D /3-D shapes in different orientations and sizes, including: - 2-D e.g. rectangles, squares, circles, triangles. - 3-D e.g. cuboids, cubes, pyramids and spheres.
	Make comparisons between objects relating to size, length, weight, capacity.	Compare length, weight, and capacity	Use measuring tools such as a ruler to measure, record and compare length/ height in standard units. Compare, describe and solve practical problems for lengths and heights, e.g. long/ short, longer/shorter, tall/short, double/half. Use measuring tools such as scales to measure/record and compare weight in standard units. Compare, describe and solve practical problems for mass/weight, e.g. heavy/light, heavier than/lighter than Measure and begin to record capacity and volume. Use measuring tools such as jugs to measure/record and compare volume in standard units. Compare, describe & solve practical problems for capacity and volume, e.g. full/empty, more/less than, half/quarter full
	Extend and create ABAB patterns – stick, leaf, stick, leaf.	Continue, copy, and create repeating patterns with varying rules, including AB, ABB, ABBC.	
	Discuss routes and locations, using words like in front of and behind. Describe a familiar route.		

KS1 AUTUMN 1: Number and Place Value

Count, read, and write to 1000 in numerals, understanding the place value of each digit and make comparisons between values.

Year 1	Year 2	Year 3
Use place value and number facts to solve problems.	Reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers.	Solve number problems and practical problems involving place value and knowledge of number facts.
Count to and across 100, forwards and backwards, beginning with 0 or 1 or from any given number.	Count in ones, tens and hundreds within 1000, forwards and backwards, beginning from any given number.	Count in ones, tens and hundreds across 1000, forwards and backwards, beginning from any given number.
Count in multiples of 2's, 5's and 10's, recognise the patterns on a 100 square, extend and fill in missing numbers.	Count in steps of 2, 3 and 5 from 0 and in 10's from any number, forwards and backwards.	Count from 0 in multiples of 4, 8, 50 and 100. [pupils now use multiples of 2, 3, 4, 5, 8, 10, 50, 100]
Read and write numerals to at least 100.	Read and write numerals to at least 100 in words and numerals.	Read and write numerals to at least 1000 in words and numerals, and position them on a number line.
Identify and represent numbers using objects and pictorial representations including the number line.	Identify, represent and estimate numbers using different representations including a number line.	Identify, represent and estimate numbers using different representation eg. bar charts/pictograms (various integers).
Given a number, identify one more and one less	Give a number and identify which is ten more and ten less	Say the number that is 1, 10 or 100 more/ less than any given 2 or 3-digit number.
	Round numbers to the nearest 10.	Round numbers to the nearest 10, 100 or 1000.
Recognise and know the value of different denominations of coins and notes.	Recognise the place value of each numeral in a 2-digit (T,U) and 3-digit (H,T,U) number and understand 0 as placeholder.	Recognise the place value of each numeral in a three digit number (H,T,U) and four digit numbers (Th, H, T, U)
Partition a teens number and larger two digit numbers into 10's and 1's and use this information to help order numbers.	Partition numbers in different ways (e.g. 23=20+3 and 23=10+13.)	Partition larger numbers in different ways (e.g. 146 =100+40+6; 146=130+16)
Position numbers into a partially completed number line and track and use this information to identify the number before, after or in-between given numbers.	Position numbers to at least 100 into a partially completed number line or square.	Position numbers to at least 1000 into a partially completed sequence.
Identify the bigger or smaller numbers in a given group of numerals or values.	Compare and order numbers up to 100 using the < and > and = signs (including money and measurements).	Compare and order numbers up to 1000 using the < and > and = signs (including money and measurements).
Develop their understanding of patterns in the number system, for example odd and even numbers.	Using numbers within and beyond 100, recognise, continue and describe common patterns in sequences e.g. multiples, odd and even numbers etc.	Explain the rule and give further examples which would be in a sequence of numbers including negative and decimal numbers.

Use the language of; equal to, more than, less than (fewer), most, least, when ordering numbers or quantities, including money / measures.	Understand and use numbers with one or two decimal places in money contexts.	Understand and use numbers with one or two decimal places in contexts involving measures or money.

KS1 AUTUMN 2: Addition and Subtraction

Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs

Year 1	Year 2	Year 3
Discuss and solve problems in familiar practical contexts.	**Solve problems with addition and subtraction applying their knowledge of mental and written methods.**	**Solve problems, including missing number problems, using number facts, place value and addition and subtraction.**
Represent and use number bonds and related subtraction facts within 20. Memorise and reason with number bonds to 10 and 20.	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.	Pupils practise solving varied addition and subtraction questions, including mental calculations with two-digit numbers where answers exceed 100.
Add and subtract one-digit and two-digit numbers to 20, including understanding the effect of adding or subtracting zero.	Add and subtract numbers using written methods and mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers	Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds
Pupils combine and increase numbers, counting forwards and backwards.	Apply their knowledge of mental (partitioning and recombining) and written methods.	Use their understanding of place value and partitioning to add/subtract 2/3 digit numbers.
	Record addition and subtraction in columns in preparation for formal written methods with larger numbers	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.
Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as: 7 = - 9	Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.	Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.
	Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	Estimate the answer to a calculation and use inverse operations to check answers.

KS1 AUTUMN 2: Money

Recognise coin values and combine amounts to make a particular value. Solve problems involving money, including giving change.

Year 1	Year 2	Year 3
Recognise and know the value of different denominations of coins and notes.	Recognise, count, read, say and write amounts of money confidently and use the symbols £ and p accurately.	Pupils fluent in the recognition of the value of coins, including mixed units.
Count coin values by counting in multiples of 2, 5, 10 and combine amounts to make a particular value.	Combine amounts to make a value and find different combinations of coins that equal the same amounts.	Combine amounts to make a value and find different combinations of coins that are equal.
Recognise and use the symbols for pounds (£) and pence (p)	Recognise and use symbols for pounds (£) and pence (p)	Record £ and p separately; Add and subtract by partitioning and recombining.
Solve simple problems in a practical context involving addition and subtraction of money.	Solve simple problems involving addition and subtraction of money, including giving change.	Add and subtract amounts of money to give change, using both £ and p

KS1 SPRING 1: Multiplication and Division

Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs

Year 1	Year 2	Year 3
Solve one-step problems involving multiplication and division.	**Solve problems in contexts involving multiplication and division.**	**Solve simple problems in context, deciding which of the four operations to use and why.**
Count on and back in 2's, 5's and 10's Make connections between arrays, number patterns and counting in twos, fives and tens.	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables [pupils should know by heart X2, X5, X10]	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables [pupils now know by heart X2, X3, X4, X5, X8, X10]
Through grouping and sharing small quantities, pupils begin to understand: ® multiplication and division; ® doubling numbers and quantities; ® finding simple fractions of objects, numbers and quantities.	·Use other multiplication tables and recall multiplication facts, including using related division facts, to perform written and mental calculations.	Use doubling to connect the 2, 4 and 8 times tables.
Find the total number of items or coins are in two or more groups by counting groups in 2's, 5's and 10's and establishing a total or by sharing equally into sets and establishing how many objects are in each group.	Make connections between place value and the 10 times table. Make connections between the 5 times table and division on a clock face.	
	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.	Calculate mathematical statements for multiplication and division using the multiplication tables that they know and write them using the multiplication (x) and division (÷) and equals (=) signs.
		Develop written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.
Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays.	Solve problems in contexts involving multiplication and division using apparatus, arrays, repeated addition, mental methods, and multiplication and division facts, including money and measures.	·Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another number cannot.	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.
	Use commutativity and inverse relations to develop multiplicative reasoning e.g. 4x5=20 and 20÷5=4.	Pupils develop efficient mental methods using commutativity and associativity e.g. 4 x 12 x 5 = 4 x 5 x 12= 20 x 12 = 240 and multiplication and division facts (e.g. 3x2=6; 6÷2=3 and 2=6÷3) to derive related facts (e.g. 30x2=60; 60÷20=30 and 20=60÷3).

KS1 SPRING 2: Shape & Space, Symmetry, Area & Perimeter

Year 1	Year 2	Year 3
Properties of shapes		
Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects.	·Recognise, name, read and write a wide variety of names for common 2-D and 3-D shapes: Quadrilaterals, polygons, cuboids, prisms, 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]	Pupils' knowledge of shapes is extended to symmetrical and non-symmetrical polygons and polyhedral. Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.
Recognise and name common 2-D /3-D shapes in different orientations and sizes, including: - 2-D e.g. rectangles, squares, circles, triangles. - 3-D e.g. cuboids, cubes, pyramids and spheres.	Compare and sort common 2-D and 3-D shapes and everyday objects, and use vocabulary [sides, vertices, edges] Identify and describe the properties of shapes: 2-D: number of sides & lines of symmetry 3-D: the number of edges, vertices & faces	Describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle Measure the perimeter of simple 2-D shapes
	Draw lines and shapes using a straight edge.	Identify horizontal/vertical/ perpendicular and parallel lines.
		Identify whether angles are greater than or less than a right angle. Recognise angles as a property of shape or a description of a turn.
Position and direction		
Use the language of position, direction and motion: left/ right, top, middle /bottom, on top of/ in front of/ above/between/ around, near, close / far, up/down, forwards/backwards, inside/outside.	·Use mathematical language to describe position, direction and movement, including: clockwise and anti-clockwise, left and right, vertical, horizontal, diagonal.	·
·Describe position, direction and movement, including whole/half/quarter /three-quarter turns. Make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.	Describe movement in a straight line and distinguish between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four complete a turn.
	Order and arrange combinations of mathematical objects in patterns and sequences, including different orientations.	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.
		Draw and label a pair of axes in all four quadrants with equal scaling, extending knowledge to all four quadrants, including the use of negative numbers.
		Draw & label rectangles, squares, rhombuses, parallelograms using coordinates in the 4 quadrants, predicting missing coordinates using properties of shapes.

KS1 SUMMER 1: Measures - length, weight, capacity & time: Use and compare different types of quantities and measures using common standard units.

Year 1	Year 2	Year 3
Compare, describe and solve practical problems for lengths and heights, mass/weight, capacity and volume and time.		
Lengths and heights		
Measure and begin to record lengths and heights.	Use appropriate standard unit/apparatus to estimate and measure length/height (m/cm) to the nearest appropriate unit.	Measure using appropriate tools and units using a wider range of measures, including comparing, using mixed units and simple equivalents
Use measuring tools such as a ruler to measure and compare length/height in standard units.	Use appropriate language including simple multiples (half as high/twice as wide) and record using standard abbreviations.	Using multiplication, compare measures (e.g. a given quantity or measure is twice as long five times as high)
Compare, describe and solve practical problems for lengths and heights, e.g. long/short, longer/shorter, tall/short etc.	Compare and order lengths and record the results using > , < and =	Connect decimals & rounding to drawing and measuring straight lines in cms. Measure, compare, add, and subtract lengths (m/cm/mm)
Mass/weight		
Measure and begin to record mass/weight	Choose and use appropriate standard unit/apparatus to estimate and measure mass/weight (kg/g) to the nearest appropriate unit.	Measure using appropriate tools and units using a wider range of measures, including comparing, using mixed units and simple equivalents
Use measuring tools such as scales to measure/compare weight in standard units.	Use appropriate language including simple multiples (half the amount/twice as heavy) and record using standard abbreviations.	Using multiplication, compare measures (e.g. a given quantity or measure is twice as long five times as high)
Compare, describe and solve practical problems for mass/weight, e.g. heavy/light, heavier than/lighter than	Compare and order weights and record the results using > , < and =	Measure, compare, add and subtract mass (kg/g)
Capacity and Volume		
Measure and begin to record capacity and volume	Choose and use appropriate standard unit/ apparatus to estimate and measure capacity (litres/ml) to the nearest appropriate unit.	Measure using appropriate tools and units using a wider range of measures, including comparing, using mixed units and simple equivalents
Use measuring tools such as jugs to measure/compare volume in standard units.	Use appropriate language including simple multiples (half the amount /twice as much) and record using standard abbreviations.	Using multiplication, compare measures (e.g. a given quantity or measure is twice as long five times as high)
Compare, describe & solve practical problems for capacity and volume, e.g. full/empty, more/less than, half/quarter full	Compare and order capacity and record the results using > , < and =	Measure, compare, add and subtract volume and capacity (l/ml)
Time		
Recognise and use language relating to dates, including days of the week, weeks, months and years.	Know the number of minutes in an hour and the number of hours in a day	Know the number of seconds in a minute and the number of days in each month, year and leap year.
Sequence events in chronological order using language for example before, after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.	Become fluent in telling the time using analogue clocks and recording it.	Tell and write the time from an analogue clock and 12-hour and 24-hour clocks Use vocabulary such as o'clock a.m./p.m.
Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show times.	Estimate/ read time with increasing accuracy to the nearest minute; record and compare time (seconds, minutes and hours)

KS1 SUMMER 2: Problem Solving: Statistics, Fractions, Decimals & Percentages Use knowledge of the four operations to solve problems in contexts

Year 1	Year 2	Year 3
Statistics		
	Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present data using bar charts, pictograms and tables.
	Pupils record, interpret, collate, organise and compare information (e.g. using many-to-one correspondence with simple ratios 2,5 and 10).	Pupils understand and use simple scales (e.g. 2, 5, 10 units per centimetre) in bar charts and pictograms with increasing accuracy.
	Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.	Solve one-step and two-step questions [for example, How many more and how many fewer?] using information presented in scaled bar charts and pictograms and tables.
	Ask and answer questions about totalling and comparing categorical data.	Interpret data presented in many contexts.
Fractions, Decimals & Percentages		
Pupils should count in fractions up to 10, starting from any number using the ½ interval – e.g. 1, 1 1/2 , 2, 2 ½	Pupils should count in fractions up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line, e.g. 1 ¼, 1 2/4, (or 1 ½) 1 ¾, 2).	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].
Recognise, find and name a half/quarter as one of two/four equal parts of an object, shape or quantity. Find half/quarter of a length, quantity, set of objects or a shape.	Recognise, find, name and write fractions 1/3 ¼, 2/4 and ¾ of a length, shape, set of objects or a quantity. [Pupils should now recognise ¼ ½ 1/3 2/4 and ¾ as a part of a whole]	Recognise, find and write fractions in the context of parts of a whole, a discrete set of objects, numbers, measurements, a shape and unit fractions as a division of a quantity.
Pupils connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.	They connect fractions to equal sharing and grouping to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes.	Compare and order unit fractions, and fractions with the same denominators. Pupils understand unit and non-unit fractions as numbers on the number line and deduce relations between them, such as size and equivalence. They should go beyond the [0,1] interval, including relating to this measure.
Pupils are taught half and quarter as 'fractions of' quantities by solving problems using shapes, objects and quantities.	Pupils use fractions by solving problems using shapes, objects and quantities	Add and subtract fractions with the same denominator within one whole [for example, 5/7 + 2/7 = 1] Add and subtract fractions with the same denominator (including improper fractions)
	Write simple fractions for example ½ of 6=3 and recognise the equivalence of 2/4 and ½.	· Pupils understand the relation between unit fractions as operators (fractions of) and division by integers.(½ of 2 = 1)
		Recognise and show, using diagrams, equivalent fractions with small denominators.

LKS2 AUTUMN 1: Number and Place Value

Count, read, and write to 1000 in numerals, understanding the place value of each digit and make comparisons between values.

Year 2	Year 3	Year 4
Reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers.	Solve number problems and practical problems involving place value and knowledge of number facts.	Solve number and practical problems with increasingly large positive numbers.
Count in ones, tens and hundreds within 1000, forwards and backwards, beginning from any given number.	Count in ones, tens and hundreds across 1000, forwards and backwards, beginning from any given number.	By counting, become fluent in the order and place value of numbers beyond 1000, including counting in 10's and 100's and other multiples. Count backwards through zero to include negative numbers.
Count in steps of 2, 3 and 5 from 0 and in 10's from any number, forwards and backwards.	Count from 0 in multiples of 4, 8, 50 and 100. [pupils now use multiples of 2, 3, 4, 5, 8, 10, 50, 100]	Count in multiples of 6, 7, 9, 25 and 1000. [Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 100 & 1000]
Read and write numerals to at least 100 in words and numerals.	Read and write numerals to at least 1000 in words and numerals, and position them in order.	Read and write numerals to at least 10 000 in words and numerals, and position them on a number line.
Identify, represent and estimate numbers using different representations including a number line.	Identify, represent and estimate numbers using different representations including bar charts/ pictograms (various integers).	Identify, represent and estimate numbers in different contexts, e.g. in the use of measuring instruments
Give a number and identify which is ten more/ ten less	Say the number that is 1, 10 or 100 more/ less than any given 2 or 3-digit number.	Find 1, 10, 100 or 1000 more or less than a given number.
Round numbers to the nearest 10.	Round numbers to the nearest 10, 100 or 1000.	Round any number to the nearest 10, 100 or 1000, including decimals to one decimal place.
Recognise the place value of each numeral in a 2-digit (T,U) and 3-digit (H,T,U) number and understand zero as placeholder.	Recognise the place value of each numeral in a three digit number (H,T,U) and four digit numbers (Th, H, T, U)	Recognise the place value of each digit in a four digit-number (Th, H, T, U)
Partition numbers in different ways (e.g. 23=20+3 and 23=10+13.)	Partition larger numbers in different ways (e.g. 146 =100+40+6; 146=130+16)	Partition larger numbers in different ways (e.g. 146 =100+40+6; 146=130+16)
Position numbers to at least 100 into a partially completed number line or square.	Position numbers to at least 1000 into a partially completed sequence.	Position numbers into a partially completed number line and use this information to identify the number before, after or in-between given numbers. Explain the rule and give further examples which would be in a sequence of numbers, including negative & decimal
Compare and order numbers up to 100 using the < and > and = signs (including money and measurements).	Compare and order numbers up to 1000 using the < and > and = signs (including money and measurements).	Order and compare numbers beyond 1000 using the < and > and = signs (including money and measurements).
Using numbers within and beyond 100, recognise, continue and describe common patterns in sequences e.g. multiples, odd and even numbers	Explain the rule and give further examples which would be in a sequence of numbers including negative and decimal 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.
Understand and use numbers with one or two decimal places in money contexts.	Understand and use numbers with one or two decimal places in contexts inc measure & money.	Extend knowledge of the number system to include decimals and fractions.

LKS2 AUTUMN 1: Decimals, percentages and fractions

Year 2	Year 3	Year 4
Solve problems that involve shapes, objects and quantities.		
Pupils should count in fractions up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line, e.g. 1 ¼, 1 2/4, (or 1 ½) 1 ¾, 2).	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].	Count using fractions and decimals, both forwards and backwards. Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
Recognise, find, name and write fractions 1/3 ¼, 2/4 and ¾ of a length, shape, set of objects or a quantity. [Pupils should now recognise ¼ ½ 1/3 2/4 and ¾ as a part of a whole]	Recognise, find and write fractions in the context of parts of a whole, a discrete set of objects, numbers, measurements, a shape and unit fractions as a division of a quantity.	Make connections between fractions of a length, of a shape and as a representation of quantities. Learn decimal notations and the language associated with it, including measurements. Recognise and write decimal equivalents (1/4, ½ , ¾ E.g. ¼ = 0.25 = 25%) Recognise and write decimal equivalents of any number of tenths or hundredths. (1/10 = 0.1, 2/10 = 0.2, 3/10 = 0.3, 3/100 = 0.003)
·	Compare and order unit fractions, and fractions with the same denominators. Pupils understand unit and non-unit fractions as numbers on the number line and deduce relations between them, such as size and equivalence. They should go beyond the [0,1] interval, including relating to this measure.	Connect hundredths to tenths, place value & decimals. Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths Compare decimal amounts and quantities with the same number of decimal places up to two decimal places e.g. by ordering on a number line. Order fractions, numbers and measures
They connect fractions to equal sharing and grouping to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes.	Add and subtract fractions with the same denominator within one whole [e.g. 5/7 + 2/7 = 1] ·Add and subtract fractions with the same denominator (including improper fractions)	Add and subtract fractions with the same denominator, becoming fluent through a variety of increasingly complex problems beyond one whole.
Pupils use fractions by solving problems using shapes, objects and quantities	·Pupils understand the relation between unit fractions as operators (fractions of) and division by integers.(½ of 2 = 1)	Solve simple measure and money problems involving fractions and decimals to two decimal places Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including where the answer is a whole number.
Write simple fractions for example ½ of 6=3 and recognise the equivalence of 2/4 and ½.	Recognise and show, using diagrams, equivalent fractions with small denominators.	Recognise and show, using diagrams, families of common equivalent fractions Use factors and multiples to recognise equivalent fractions and simplify where appropriate (e.g. 6/9 = 2/3 or ¼ = 2/8)
·	·	·Round decimals with one decimal place to the nearest whole number

LKS2 AUTUMN 2: Addition and Subtraction

Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs

Year 2	Year 3	Year 4
Solve problems with addition and subtraction applying their knowledge of mental and written methods.	Solve problems, including missing number problems, using number facts, place value and more complex +/-	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.	Pupils practise solving varied addition and subtraction questions, including mental calculations with two-digit numbers where answers exceed 100.	Pupils continue to practise both mental methods and column addition and subtraction with increasingly large numbers.
Add and subtract numbers using written methods and mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers	Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds	Add and subtract numbers mentally with increasingly large numbers.
Apply their knowledge of mental (partitioning and recombining) and written methods.	Use their understanding of place value and partitioning to add/subtract increasingly large numbers.	.
Record addition and subtraction in columns in preparation for formal written methods with larger numbers	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.	Add and subtract numbers with up to 4-digits using the formal written methods of column addition and subtraction where appropriate.
Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.	Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	Estimate the answer to a calculation and use inverse operations to check answers.	Estimate and use inverse operations to check answers to a calculation.
LKS2 AUTUMN 2: Money Recognise coin values and combine amounts to make a particular value. Solve problems involving money, including giving change.		
Recognise, count, read, say and write amounts of money confidently and use the symbols £ and p accurately.	Pupils fluent in the recognition of the value of coins, including mixed units.	.
Combine amounts to make a particular value and find different combinations of coins that equal the same amounts of money.	Combine amounts to make a particular value and find different combinations of coins that equal the same amount.	.
Recognise and use symbols for pounds (£) and pence (p)	Record £ and p separately; Add and subtract by partitioning and recombining.	.
Solve simple problems involving addition and subtraction of money, including giving change.	Add and subtract amounts of money to give change, using both £ and p	.

LKS2 SPRING 1: Measures - length, weight, capacity & time Compare, describe and solve practical problems for lengths and heights, mass/weight, capacity, volume and time.

Year 2	Year 3	Year 4
Lengths and heights		
Choose and use appropriate standard unit/apparatus to estimate and measure length/height (m/cm) to the nearest appropriate unit.	Measure using appropriate tools and units including comparing /using mixed units (e.g. 1m and 30cm) and simple equivalents	Build on understanding of place value and decimal notation to record metric measures (cm/m/mm/m/km)
Use appropriate language including simple multiples (half as high/twice as wide) and record using standard abbreviations.	Using multiplication, compare measures (e.g. a given quantity or measure is twice as long five times as high)	Estimate, compare and calculate different measures (cm/m/mm/m/km)
Compare and order lengths and record the results using > , < and =	Connect decimals and rounding to drawing and measuring straight lines in cm's,Measure, compare, + and - lengths	Convert between different units of measure (e.g. kilometre to metre) Use multiplication to convert from larger to smaller units.
Mass/weight		
Choose and use appropriate standard unit/apparatus to estimate and measure mass/weight (kg/g) to the nearest appropriate unit.	Measure using appropriate tools and units including comparing and using mixed units (e.g. 1kg and 200g) and simple equivalents	Build on understanding of place value and decimal notation to record metric measures (kg/g e.g. 1.2kg)
Use appropriate language (half the amount/twice as heavy) and record using standard abbreviations.	Using multiplication, compare measures (e.g. a given quantity or measure is twice as long five times as high)	Estimate, compare and calculate different measures (kg g)
Compare & order weights and record the results using > , < =	Measure, compare, add and subtract mass (kg/g)	Convert between different units of measure (e.g. g to kgs)
Capacity and Volume		
Choose and use appropriate standard unit/ apparatus to estimate and measure capacity (litres/ml) to the nearest appropriate unit.	Measure using appropriate tools and units including comparing and using mixed units (e.g. 1kg and 200g) and simple equivalents	Build on understanding of place value and decimal notation to record metric measures, (ml/l).
Use appropriate language including simple multiples (half the amount /twice as much) and record using standard abbreviations.	Using multiplication, compare measures (e.g. a given quantity or measure is twice as long five times as high)	Estimate, compare and calculate different measures (ml/l).
Compare and order capacity and record the results using > , < and =	Measure, compare, add and subtract volume and capacity (l/ml)	Convert between different units of measure (e.g. ml to litres)
Area and Perimeter		
.	Measure the perimeter of simple 2-D shapes	Measure and calculate the perimeter of a rectilinear figure (cm & m) Know that perimeter can be expressed algebraically as 2(a+b)
.	.	Find the area of rectilinear shapes by counting squares
Time		
Know the number of minutes in an hour and the number of hours in a day	Know the number of seconds in a minute/ the number of days in each month/ year	Read, write and convert time between analogue and digital 12- and 24-hour clocks
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.	Estimate and read time from a 12/24 hour close with increasing accuracy to the nearest minutes	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.

LKS2 SPRING 2: Multiplication and Division Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs

Year 2	Year 3	Year 4
Solve simple problems in context, deciding which of the four operations to use and why.		
Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables [pupils should know by heart X2, X5, X10]	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables [pupils now know by heart X2, X3, X4, X5, X8, X10]	Recall multiplication and division facts for multiplication tables up to 12X12. Count in multiples of 6, 7, 9, 25 and 1000. [Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 100 & 1000]
Use other multiplication tables and recall multiplication facts, including using related division facts, to perform written and mental calculations.	Use doubling to connect the 2, 4 and 8 times tables.	Combine knowledge of number facts and rules of arithmetic to solve mental and written calculations e.g. 2X6X5 = 10X6 = 60 Practise mental methods and extend this to three-digit numbers to derive facts, e.g.600 ÷ 3 = 200 can be derived from 2 x 3 = 6).
Make connections between place value and the 10 times table. Make connections between the 5 times table and division on a clock face.		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.
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.	Calculate mathematical statements for multiplication and division using the multiplication tables that they know and write them using the multiplication (x) and division (÷) and equals (=) signs.	
	Develop written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout (short multiplication and short division with exact answers).
Solve problems in contexts involving multiplication and division using apparatus, arrays, repeated addition, mental methods, and multiplication and division facts, including money and measures.	Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	Solve two step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. · Solve integer scaling problems and harder correspondence problems such as n objects are connected to m objects.
Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another number cannot.	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another number cannot.	Recognise and use factor pairs and commutativity in mental calculations.
Use commutativity and inverse relations to develop multiplicative reasoning e.g. 4x5=20 and 20÷5=4.	Pupils develop efficient mental methods using commutativity and associativity e.g. 4 x 12 x 5 = 4 x 5 x 12= 20 x 12 = 240 and multiplication and division facts (e.g. 3x2=6; 6÷2=3 and 2=6÷3) to derive related facts (e.g. 30x2=60; 60÷20=30 and 20=60÷3).	Write statements about the equality of expressions (e.g. the distributive law 39X7 = 30 X 7 + 9+7 and associative law (2X3) X4 = 2 X (3X4)).

LKS2 SUMMER 1: Geometry

Year 2	Year 3	Year 4
Properties of shapes		
Recognise, name, read and write a wide variety of names for common 2-D and 3-D shapes: Quadrilaterals, polygons, cuboids, prisms, cones. Identify 2-D shapes on the surface of 3-D shapes eg a circle on a cylinder & a triangle on a pyramid	Recognise, name, read and write symmetrical & non-symmetrical polygons and polyhedral. Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
Compare and sort common 2-D and 3-D shapes and everyday objects, and use vocabulary [sides, vertices, edges] precisely. Identify and describe the properties of shapes: - 2-D: number of sides & lines of symmetry - 3-D: the number of edges, vertices & faces.	Describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and acute and obtuse for angles greater or lesser than a right angle	Classify different triangles (e.g. isosceles, equilateral, scalene) and quadrilaterals (e.g. parallelogram, rhombus, trapezium)
Draw lines and shapes using a straight edge.	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	Identify lines of symmetry in 2-D shapes presented in different orientations. Draw symmetric patterns to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams. Complete a simple symmetric figure with respect to a specific line of symmetry.
·	Identify whether angles are greater than or less than a right angle. Recognise angles as a property of shape or a description of a turn.	Identify acute and obtuse angles and compare and order angles up to two right angles by size Compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular/ irregular.
Position and direction		
Use mathematical language to describe position, direction and movement, including: left/right/ vertical/ horizontal/ diagonal/(anti)clockwise	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four complete a turn.	Describe movements between positions as translations of a given unit to the left/right and up/down.
Describe movement in a straight line and distinguish between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	Describe positions on coordinate grid Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	Describe positions on a 2-D grid as coordinates in the first quadrant Plot specified points and draw sides to complete a given polygon.
Order and arrange combinations of mathematical objects in patterns and sequences, including those in different orientations.	Draw/ label a pair of axes in all four quadrants with equal scaling, including negative numbers. Draw /label rectangles, squares, rhombuses, parallelograms specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes.	·Draw a pair of axes in one quadrant, with equal scales and integer labels. Read, write and use pairs of coordinates, for example (2,5), including using coordinate-plotting ICT tools.

LKS2 SUMMER 2: + - X ÷ , problems and statistics Use knowledge of the four operations to solve problems including money, measures & data handling.		
Year 2	Year 3	Year 4
Addition and Subtraction		
Add and subtract numbers using written methods and mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers	Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds	Pupils continue to practise both mental methods and column addition and subtraction with increasingly large numbers.
Apply their knowledge of mental (partitioning and recombining) and written methods.	Use their understanding of place value and partitioning to add/subtract increasingly large numbers.	Add and subtract numbers mentally with increasingly large numbers.
Record addition and subtraction in columns in preparation for formal written methods with larger numbers	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.	Add and subtract numbers with up to 4-digits using the formal written methods of column addition and subtraction where appropriate.
Multiplication and Division		
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.	Calculate mathematical statements for multiplication and division using the multiplication tables that they know and write them using the multiplication (x) and division (÷) and equals (=) signs.	Combine knowledge of number facts and rules of arithmetic to solve mental and written calculations e.g. 2X6X5 = 10X6 = 60 Practise mental methods and extend this to three-digit numbers to derive facts, e.g.600 ÷ 3 = 200 can be derived from 2 x 3 = 6).
·	Develop written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers & progressing to the formal written methods.	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout (short multiplication and short division with exact answers).
Statistics		
Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present data using bar charts, pictograms and tables.	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
Pupils record, interpret, collate, organise and compare information (for example using many-to-one correspondence with simple ratios 2,5 and 10).	Pupils understand and use simple scales (e.g. 2, 5, 10 units per centimetre) in bar charts and pictograms with increasing accuracy.	Understand and use a greater range of scales in their representations.
Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.	Solve one-step and two-step questions [for example, How many more and how many fewer?] using information presented in scaled bar charts and pictograms and tables.	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. ·
Ask and answer questions about totalling and comparing categorical data.	Interpret data presented in many contexts.	Relate graphical representation of data to recording change over time.

UKS2 AUTUMN 1: Number and Place Value Count, read, and write to 10 000 000 in numerals, understanding the place value of each digit and make comparison between values.		
Year 4	Year 5	Year 6
Solve number and practical problems with increasingly large positive numbers.	**Solve number problems and practical problems that involve:**	**Solve number problems and practical problems that involve:**
By counting, become fluent in the order and place value of numbers beyond 1000, including counting in 10's and 100's and other multiples. Count backwards through zero to include negative numbers.	Count forwards / backwards in steps of powers of 10 for any given number up to 1 000 000 Count forwards and backwards with positive and negative whole numbers - including through zero.	Use negative numbers in context, and calculate intervals across zero.
Count in multiples of 6, 7, 9, 25 and 1000. [Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 100 & 1000]	Count in multiples of 11, 12, 15. [Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 100 & 1000]	[Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 25, 50, 100 & 1000]
Read and write numerals to at least 10 000 in words and numerals, and position them on a number line.	Read, write, order and compare numerals to at least 1 000 000 and determine the value of each digit.	Say, read, write, order and compare numbers up to 10 000 000 and up to three decimal places
Identify, represent and estimate numbers in different contexts, e.g. in the use of measuring instruments		
Find 1, 10, 100 or 1000 more or less than a given number.		
Recognise the place value of each digit in a four digit-number (Th, H, T, U)	Identify the place value in large whole numbers and interpret negative numbers in contexts.	Determine the value of each digit in numbers up to 10 000 000 and up to three decimal places
Round any number to the nearest 10, 100 or 1000.	Round any whole number up to 1 000 000 to the nearest 10, 100, 1000, 10 000, 100 000	Round any whole number to a required degree of accuracy.
Order and compare numbers beyond 1000 using the < and > and = signs (including money and measurements).	Order and compare numbers up to 1 000 000 using the < and > and = signs (including money and measurements).	Order and compare numbers up to 10 000 000 using the < and > and = signs (including money and measurements).
Position numbers into a partially completed number line and track and use this information to identify the number before, after or in-between given numbers. Explain the rule and give further examples which would be in a sequence of numbers including negative and decimal numbers.	Recognise and describe linear number sequences including those involving fractions and decimals (e.g. 3, 3 ½ , 4, 4 ½), and find the term-to-term rule in words (e.g. add ½).	Explain the rule and give further examples which would be in a sequence of numbers including common multiples, prime numbers, factors, negative and decimal numbers (including money), fractions and mixed measures.
Extend knowledge of the number system to include decimals and fractions.	Extend and apply their understanding of the number system to the decimal numbers and fractions.	Extend and apply their understanding of the number system to the decimal numbers and fractions they have met so far.
Read Roman numerals to 100 (I to C) and know that, over time, the numeral system changed to include the concept of zero and place value.	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

UKS2 AUTUMN 1: Decimals, Fractions and Percentages		
Year 4	**Year 5**	**Year 6**
Recognise decimals, percentages and fractions are different ways of expressing numbers /proportions.		
Count forwards/backwards in fractions & decimals Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	Count forwards and backwards in simple fractions and decimals, orally and using a number line.	
Make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Learn decimal notations and the language associated with it, including measurements. Recognise and write decimal equivalents (1/4, ½ , ¾ E.g. ¼ = 0.25 = 25%) Recognise and write decimal equivalents of any number of tenths or hundredths. (1/10 = 0.1, 2/10 = 0.2, 3/10 = 0.3, 3/100 = 0.003)	Develop understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities Say, read & write decimal fractions & related tenths/hundredths/thousandths accurately, checking the reasonableness of their answers Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	
Connect hundredths to tenths and place value and decimal measure. Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths Compare decimal amounts and quantities with the same number of decimal places up to two decimal places e.g. by ordering on a number line. Extend the use of the number line to connect fractions, numbers and measures	Extend knowledge of fractions to recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Compare & order fractions whose denominators are all multiples of the same number. Read, write, order and compare numbers with up to three decimal places Read and write decimal numbers as fractions (for example 0.71 = 71/100) Know that percentages, decimals and fractions are different ways of expressing proportions & make connections between percentages, fractions and decimals (e.g. 100% represents a whole quantity and 1% is 1/100, 50% is 50/100, 25% is 25/100) & relate this to finding 'fractions of'.	Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places Compare and order fractions, including fractions > 1
Add and subtract fractions with the same denominator, becoming fluent through a variety of increasingly complex problems beyond one whole.	+ and - fractions with the same denominator and denominators that are multiples of the same number. Extend their understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number. Add and subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places and complements of 1 (e.g. 0.83+0.17=1) Mentally add and subtract tenths, and one-digit whole numbers and tenths.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions, beginning with fractions where the denominator of one fraction is a multiple of the other (e.g. ½ + 1/8 = 5/8) and progressing to varied and increasingly complex problems.
Solve simple measure and money problems involving fractions and decimals to two decimal places 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.	Go beyond money and measure models of decimals in solving problems/ puzzles involving numbers up to three decimal places. Solve problems which require knowing percentage and decimal equivalents 1/2 , ¼ 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.	Solve problems using their understanding of the relationship between unit fractions and division to work backwards e.g. multiplying a quantity that represents a unit fraction to find the whole quantity (e.g. if ¼ of a length is 36 cm then the whole length is 36 X 4 = 144cm)

Recognise and show, using diagrams, families of common equivalent fractions Use factors and multiples to recognise equivalent fractions and simplify where appropriate (e.g. 6/9 = 2/3 or ¼ = 2/8)	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 5/6 = 1 1/5)	Associate a fraction with division and calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g. 3/8] Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Recall and use equivalences between simple fractions, decimals and percentages in contexts. Convert simple fractions to decimals (e.g. 3÷8= 0.375). For simple fractions with recurring decimal equivalents, pupils learn the decimal to three decimal places, or other approximations depending on the context.
Round decimals with one decimal place to the nearest whole number	Round decimals with two decimal places to the nearest whole number and to one decimal place.	Develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers
		Multiply one-digit numbers with up to two decimal places by whole numbers. In practical contexts (money and measures), calculate division of decimal numbers by one-digit whole numbers, such as 0.4 X 2 = 0.8 Pupils multiply and divide numbers where the answer has up to two decimal places
	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Use a variety of images to support their understanding of multiplication with fractions. Multiply simple pairs of proper fractions, writing the answer in its simplest form [eg ¼ X ½ = 1/8] Divide proper fractions by whole numbers [e.g. 1/3 ÷ 2 = 1/6] Practice calculations with simple fractions and decimal fraction equivalents to aid fluency.

UKS2 AUTUMN 2: 4 Operations Solve multi-step problems in contexts, deciding which operations and methods to use and why.		
Year 4	**Year 5**	**Year 6**
Addition and Subtraction		
Pupils continue to practise both mental methods and column addition and subtraction with increasingly large numbers.	Add and subtract whole numbers with more than 4 digits, including using formal written methods (column addition and subtraction)	Tackle mental calculations with increasingly large numbers, mixed operations and more complex calculations
Add and subtract numbers mentally with increasingly large numbers.	Add and subtract numbers mentally with increasingly large numbers (e.g. 12 462 – 2300 = 10 162)	Practice addition and subtraction for larger numbers, using the formal written methods of column addition and subtraction.
Add and subtract numbers with up to 4-digits using the formal written methods of column addition and subtraction where appropriate.	Use the formal written methods of column addition and subtraction with increasingly large numbers.	·
Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Estimate and use inverse operations to check answers to a calculation.		Use estimation to check answers to calculations and determine in the context of the problem and appropriate degree of accuracy.
	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.	Round answers to a specified degree of accuracy e.g. to the nearest 10, 20, 50 etc. but not to a specified number of significant figures.
		Use knowledge of the order of operations using brackets; for example 2+1X3=5 and (2+1) X 3 = 9
Multiplication and Division		
Recall multiplication and division facts for multiplication tables up to 12X12. Count in multiples of 6, 7, 9, 25 and 1000. [Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 100 & 1000]	Count in multiples of 11, 12, 15. [Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 100 & 1000 Multiply and divide numbers mentally drawing upon known facts.	[Pupils now use multiples of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 25, 50, 100 & 1000] Undertake metal calculations with increasingly large numbers and more complex calculations.
Combine knowledge of number facts and rules of arithmetic to solve mental and written calculations e.g. 2X6X5 = 10X6 = 60 ·Practise mental methods and extend this to three-digit numbers to derive facts, e.g.600 ÷ 3 = 200 can be derived from 2 x 3 = 6).	·	Use multiplication tables to calculate mathematical statements. Perform mixed calculations, including mixed operations and large numbers
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.	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Use multiplication and division as inverses to support the introduction of ratio e.g. multiplying and dividing by powers of 1000 in converting between units such as kilometres and metres.	

Multiply two-digit and three-digit numbers by a one-digit number using formal written layout (short multiplication and short division with exact answers).	Multiply numbers up to 4 digits by a one- or two-digit number using formal written method, including long multiplication for two-digit numbers. Divide numbers up to 4 digits by a one-digit number using the formal written method. Interpret non-integer answers to division by expressing results in different ways according to context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 98/4 = 24 r2 = 24 ½ = 24.5 or rounds to 25)	Calculate multiplication of numbers up to 4 digits by a two-digit whole number, using the formal written methods of short & long multiplication Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.
Recognise and use factor pairs and commutativity in mental calculations.	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Recognise and use square numbers and cube numbers, and the notation squared (^{2}) cubed (^{3})	Identify common factors, common multiples and prime numbers. Relate common factors to finding equivalent fractions.
Solve two step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. Solve integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Solve problems involving multiplication and division including - knowledge of factors and multiples, squares and cubes. - scaling by simple problems involving simple rates.	Solve problems involving addition, subtraction, multiplication and division. Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Round answers to a specified degree of accuracy e.g. to the nearest 10, 20, 50 etc. but not to a specified number of significant figures
Write statements about the equality of expressions (e.g. the distributive law 39X7 = 30 X 7 + 9+7 and associative law (2X3) X4 = 2 X (3X4)).	Use and explain the equals sign to indicate equivalence, including in missing number problems (e.g. 13+24 = 12 + 25; 33 = 5 X) Understand the term factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (e.g. 4X35 = 2X2X35; 3X270 = 3X3X9X10 = 9² X 10)	
	Distributivity can be expressed as a(b+c) = ab + ac.	Explore the order of operations using brackets, 2 +1 x 3 = 5 and (2 + 1) x 3 = 9. Use their knowledge of the order of operations to carry out calculations involving the four operations.

UKS2 AUTUMN 2: Ratio & Proportion		
Solve multi-step problems in contexts, deciding which operations and methods to use and why.		
Year 4	Year 5	Year 6
		Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
		Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.
		Solve problems involving similar shapes where the scale factor is known or can be found.

		Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
		Recognise proportionality in contexts where the relations between quantities are in the same ratio (e.g. similar shapes and recipes)
		Link percentages or 360º to calculating angles of pie charts.
		Solve problems which compare quantities, sizes and scale drawings. They might use the notation a:b to record their work.
		Solve problems involving unequal quantities, e.g. 'for every egg you need three spoonfuls of flour', '3/5 of the class are boys'.

UKS2 SPRING 1: Geometry Solve multi-step problems in contexts, deciding which operations and methods to use and why.

Year 4	Year 5	Year 6
Properties of shapes.		
Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Classify different triangles (e.g. isosceles, equilateral, scalene) and quadrilaterals (e.g. parallelogram, rhombus, trapezium)	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations Use the term diagonal and make conjectures about the angles formed between sides and between diagonals and parallel sides, and other properties of quadrilaterals.	Draw 2-D shapes using given dimensions/angles. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. Recognise, describe and build simple 3-D shapes, including making nets. Draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles.
Identify lines of symmetry in 2-D shapes presented in different orientations. Draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry ; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape. Complete a simple symmetric figure with respect to a specific line of symmetry.	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles Use the properties of rectangles to deduce related facts and find missing lengths and angles Draw lines with a ruler to the nearest millimetre. Use conventional markings for parallel lines and right angles.	Describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements Compare and classify geometric shapes based on their properties and sizes and
Identify acute and obtuse angles and compare and order angles up to two right angles by size Compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular.	Measure angles accurately with a protractor. Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Identify angles at a point and one whole turn (360 º), angles at a point on a straight line and a ½ turn (180 º) and other multiples of 90 º Use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems. Draw given angles, and measure them in degrees	Recognise angles where they meet at a point, are on a straight line or are vertically opposite and find missing angles. Find unknown angles in any triangles, quadrilaterals and regular polygons.
Position & Direction		
Describe movements between positions as translations of a given unit (left/right and up/down.)	Identify, describe & represent the position of a shape following a reflection or translation.	

Describe positions on a 2-D grid as coordinates in the first quadrant. Plot specified points and draw sides to complete a given polygon. Draw a pair of axes in one quadrant, with equal scales and integer labels. Read, write and use pairs of coordinates, for example (2,5)	Recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes.	

UKS2 SPRING 2: Measurement Solve multi-step problems in contexts, deciding which operations and methods to use and why.

Year 4	Year 5	Year 6
Build on understanding of place value and decimal notation to record metric measures, including money.	Estimate volume [e.g. using 1 cm³ blocks to build cuboids (including cubes)] and capacity (e.g. using water)	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]
Convert between different units of measure (e.g. kilometre to metre, hour to minute) Use multiplication to convert from larger to smaller units.	Use their knowledge of place value and multiplication and division to convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.	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 up to three decimal places. Convert between miles and kilometres and connect conversion (e.g. from kilometres to miles) to graphical representation in linear graphs.
Estimate, compare and calculate different measures, including money in pounds and pence.	Use all four operations to solve problems involving measure [e.g. length, mass, volume, money] using decimal notation, including conversions (e.g. days to weeks) and scaling.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. Know approximate conversions and tell if an answer is sensible.
Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres Perimeter can be expressed algebraically as 2(a+b) where a and b are the dimensions in the same unit.	Calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths. Missing measures questions such as these can be expressed algebraically e.g. 4+2b=20 for rectangle of sides 2 cm and b cm Measure and calculate the perimeter of composite rectilinear shapes in cm and m	Recognise that shapes with the same areas can have different perimeters and vice versa
Find the area of rectilinear shapes by counting squares Relate area to arrays and multiplication.	Calculate and compare the area of rectangles (including squares) and including standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes Calculate the area from scale drawings using given measurements.	Relate the area of rectangles to parallelograms and triangles, e.g. by dissection, and to calculate their areas, understanding and using formulae (in words or symbols) to do this. Calculate the area of parallelograms and triangles
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.	Solve problems involving converting between units of time.	Using the number line, pupils use, add and subtract positive and negative integers for measures such as temperature.

UKS2 Summer 1: Statistics & Algebra

Statistics: Interpret and present data using bar charts, time graphs, tables and pie charts.

Year 4	Year 5	Year 6
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	Connect work on coordinates and scales to their interpretation of time graphs. Complete, read and interpret information in tables, including timetables.	Encounter and draw graphs relating to two variables, arising from their own enquiry and in other subjects. Interpret and construct pie charts and line graphs and use these to solve problems.Connect knowledge of angles, fractions and percentages to aid interpretation of pie charts.
Understand and use a greater range of scales in their representations.	Decide which representations of data are most appropriate and why.	
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 a line graph.	Know when it is appropriate to find the mean of a data set & calculate and interpret the mean as an average.
Relate graphical representation of data to recording change over time.		Connect conversion from kilometres to miles in measurement to its graphical representations.
Algebra		
		Use simple formulae.
		Generate and describe linear number sequences.
		Express missing number problems algebraically.
		Find pairs of numbers that satisfy an equation with two unknowns.
		Enumerate possibilities of combinations of two variables.
		Use symbols and letters to represent variables and unknowns in mathematical situations that they already understand,e.g.: ● missing numbers, lengths, coordinates and angles. ● formulae in maths and science ● equivalent expressions (e.g. a+b = b+a) ● generalisations of number patterns ● number puzzles (e.g. what two numbers can add up to).

UKS2 Summer 2: Decimals, Fractions and Percentages		
Year 4	Year 5	Year 6

Count forwards/backwards in fractions & decimals Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	Count forwards and backwards in simple fractions and decimals, orally and using a number line.	
Make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Learn decimal notations and the language associated with it, including measurements. Recognise and write decimal equivalents (1/4, ½ , ¾ E.g. ¼ = 0.25 = 25%) Recognise and write decimal equivalents of any number of tenths or hundredths. (1/10 = 0.1, 2/10 = 0.2, 3/10 = 0.3, 3/100 = 0.003)	Develop understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities Say, read & write decimal fractions & related tenths/hundredths/thousandths accurately, checking the reasonableness of their answers Recognise the percent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	
Connect hundredths to tenths and place value and decimal measure. Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ·Compare decimal amounts and quantities with the same number of decimal places up to two decimal places e.g. by ordering on a number line. Extend the use of the number line to connect fractions, numbers and measures	Extend knowledge of fractions to recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Compare & order fractions whose denominators are all multiples of the same number. Read, write, order and compare numbers with up to three decimal places Read and write decimal numbers as fractions (for example 0.71 = 71/100) Know that percentages, decimals and fractions are different ways of expressing proportions & make connections between percentages, fractions and decimals (e.g. 100% represents a whole quantity and 1% is 1/100, 50% is 50/100, 25% is 25/100) & relate this to finding 'fractions of'.	Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places Compare and order fractions, including fractions > 1
Add and subtract fractions with the same denominator, becoming fluent through a variety of increasingly complex problems beyond one whole.	Add and subtract fractions with the same denominator and denominators that are multiples of the same number. Extend understanding of + and - fractions to calculations that exceed 1 as mixed numbers. + and - decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places and complements of 1 (e.g. 0.83+0.17=1) Mentally add and subtract tenths, and one digit whole numbers and tenths.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions, beginning with fractions where the denominator of one fraction is a multiple of the other (e.g. ½ + 1/8 = 5/8) and progressing to varied and increasingly complex problems.
Year 4	**Year 5**	**Year 6**
Solve simple measure and money problems involving fractions and decimals to two decimal places 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.	Go beyond money and measures models of decimals in solving problems/ puzzles involving numbers up to three decimal places. Solve problems which require knowing percentage and decimal equivalents 1/2 , ¼ 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.	Solve problems using their understanding of the relationship between unit fractions and division to work backwards e.g. multiplying a quantity that represents a unit fraction to find the whole quantity (e.g. if ¼ of a length is 36 cm then the whole length is 36 X 4 = 144cm)

Recognise and show, using diagrams, families of common equivalent fractions Use factors and multiples to recognise equivalent fractions and simplify where appropriate (e.g. 6/9 = 2/3 or ¼ = 2/8)	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 5/6 = 1 1/5)	Associate a fraction with division and calculate decimal fraction equivalents [e.g. 0.375] for a simple fraction [e.g. 3/8] Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Recall and use equivalences between simple fractions, decimals and percentages in contexts. Convert simple fractions to decimals (e.g. 3÷8= 0.375). For simple fractions with recurring decimal equivalents, pupils learn the decimal to three decimal places, or other approximations depending on the context.
Round decimals with one decimal place to the nearest whole number	Round decimals with two decimal places to the nearest whole number and to one decimal place.	Develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers
·	·	Multiply one-digit numbers with up to two decimal places by whole numbers. In practical contexts (money and measures), calculate division of decimal numbers by one-digit whole numbers, such as 0.4 X 2 = 0.8 Pupils multiply and divide numbers where the answer has up to two decimal places
·	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Use a variety of images to support their understanding of multiplication with fractions. Multiply simple pairs of proper fractions, writing the answer in its simplest form [eg ¼ X ½ = 1/8] Divide proper fractions by whole numbers [e.g. 1/3 ÷ 2 = 1/6] Practice calculations with simple fractions and decimal fraction equivalents to aid fluency.

Calculation Policy: FS
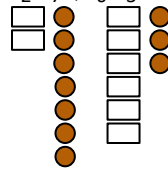
Foundation Stage ELG:
· Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
· Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.
· They solve problems, including doubling, halving and sharing.

	Addition		**Subtraction**	
Mental Calculation Strategies	Children to find one more than a given number by counting on. 1→ 2→ 3→ 4→ 5→ 6→ 7→ 8→ 9→10	Use fingers as practical apparatus to solve addition calculations. 5 + 5 = 10	Children to find one less than a given number by counting backwards. 10→ 9→ 8→ 7→ 6→ 5→ 4→ 3→ 2→1	Use fingers as practical apparatus to solve subtraction problems. 10 - 5 = 5
Written Methods	Solve simple addition problems using objects, pictures or practical apparatus. Combine two sets of objects and count all to find the total. 3 + 3 = 6	Use simplified illustrations (arrays of Maltesers) to create a picture of an addition problem. 7 + 4 = 11 1 4 + 6 = 20 Addition of two numbers horizontally by partitioning into Maltesers and counting all.	Solve simple subtraction problems using objects, pictures or practical apparatus. Children to solve subtraction calculations by taking away objects. Cross out pictures to demonstrate taking away.	Use simplified illustrations (arrays of Maltesers) to create a picture of a subtraction problem. 7 - 4 = 3 3 6 - 5 = 31

Using pictures and marks to illustrate how they have solved an addition problem.

3 + 2 = 5

2 7 + 6 3 = 90
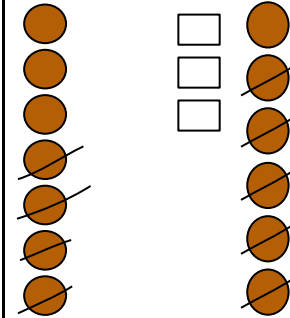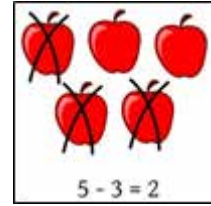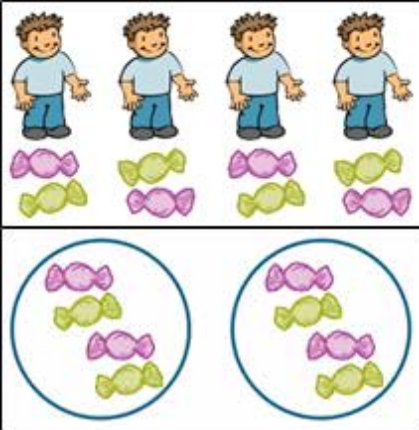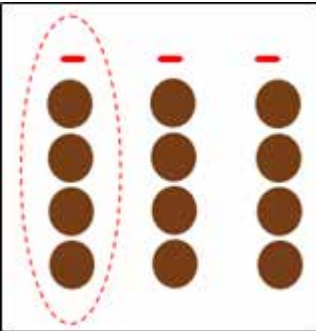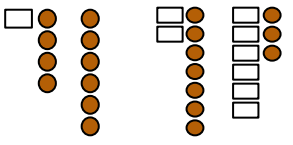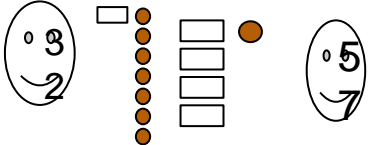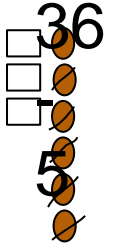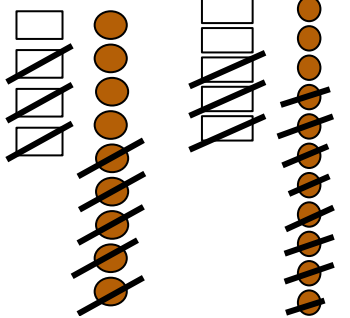
5 - 3 = 2

Subtraction of two numbers horizontally by partitioning the larger number into Maltesers, crossing out the number to be taken away (beginning at the bottom) and then counting all that are 'left'.
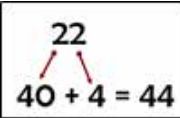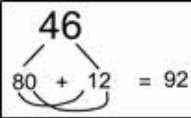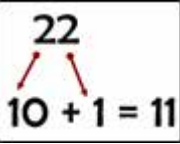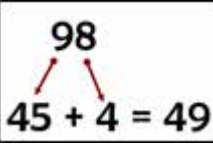
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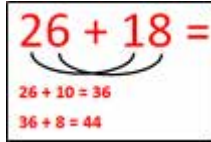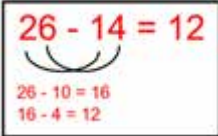
Foundation Stage ELG:
·   Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
·   Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.
·   They solve problems, including doubling, halving and sharing.

	Multiplication		Division	
Mental Calculation Strategies	**Counting by rote:** Children can count in 2s and 10s. Children can also count by rote using fingers to count in groups. **Times tables:** Know by heart the facts for the 2x and 10x tables.	**Doubling:** Children should be able to double each whole number to 5 (recall). Children can use fingers to double each number to 5 … Example 3 + 3 = 6		**Halving:** Children should be able to half each even number to 10 (recall).
Written Methods	**Count repeated sets of objects:** Combine repeated sets of objects. Count objects by grouping into given amounts. Group pictorial arrays into sets i.e group socks into sets of two. 	**Repeated Addition:** Solve through repeated addition using simple illustrations (arrays of maltesers). E.g. There are 4 apples in a box. How many apples in 3 boxes? 	**Share objects equally.** 	**Sharing:** Use simplified illustrations (arrays of Maltesers) to create pictures of a division problems. 12 ÷ 3 =

Calculation Policy: KS1

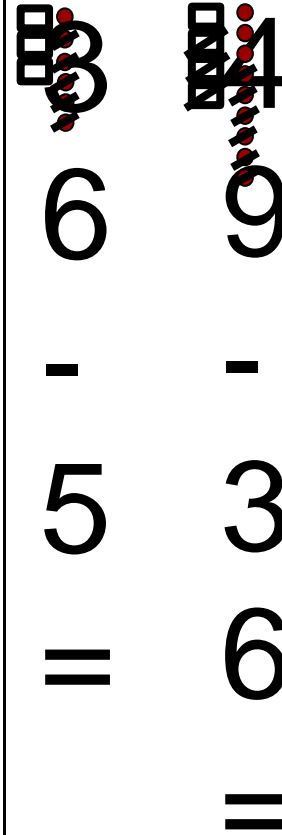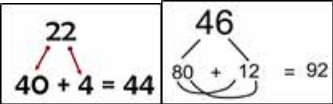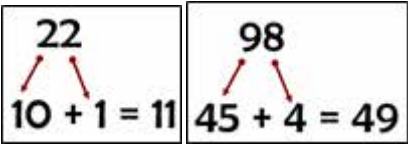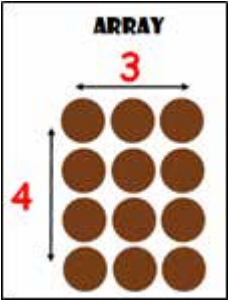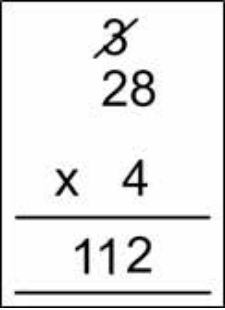|	Y1		Yr 2	

	- Bonds to 10/20
	- Subtraction facts from 10/20
	- Add and subtract one-digit and two-digit numbers to 20, including zero
	·
			· Times tables: x2, x5, x10
			· Double numbers to 20
			· Double multiples of 10 (up to 100)
			  Halve even numbers to 20
			· Halve multiples of 10 (up to 100)
				·Add and subtract:
				  a two-digit number and ones
				  a two-digit number and tens
				  two two-digit numbers
				  adding three one-digit numbers

	Addition		**Subtraction**	
Mental Calculation Strategies	Addition of a single digit number by counting on (possibly using fingers for support). Children put the big number in their head and count on the number of places indicated by the smaller number. $17 + 9 = 26$	Addition of a 2-digit number, using partitioning. First add the tens and then add the units. $26 + 18 =$ $26 + 10 = 36$ $36 + 8 = 44$	Subtraction of a single digit number by counting back (possibly using fingers to support). Children put the big number in their head and count the number of places indicated by the smaller number. $18 - 7 = 11$	Subtraction of a 2-digit number, using partitioning. First subtract the tens and then subtract the units. $26 - 14 = 12$ $26 - 10 = 16$ $16 - 4 = 12$
Written Methods	Addition of two numbers horizontally by partitioning into Maltesers and counting all (two digit + one digit, and two digit + two digit). $1\ \ 4 + 6 = 20\ \ 2\ 7 + \ 63 = 90$	Addition of two numbers horizontally by partitioning the smaller number into Maltesers and counting 'on' (putting the biggest number first) $32\ \ \ + \ 1\ 7\ \ \ \ 4\ \ \ 1\ \ \ + 57 =$	Subtraction of two numbers horizontally by partitioning the larger number into Maltesers, crossing out the number to be taken away (beginning at the bottom) and then counting all that are 'left'	Subtraction of two numbers horizontally where a packet of 10 Maltesers needs to be opened – 'split' $49\ -\ 35\ =\ \ \ \ \ \ 51\ -\ 28\ =$

Calculation Policy: KS1

	Y1	Yr 2	
	• Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • Add and subtract one-digit and two-digit numbers to 20, including zero	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 - adding three one-digit numbers	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs.
	Multiplication	**Division**	
Mental Calculation Strategies	**Counting by rote:** Children can count in 2s, 3s, 5s and 10s. e.g. counting fingers in 5s: 5 10 15 20 Children can also count by rote using fingers to group in groups. **Times tables:** Know by heart the facts for the 2x, 5x and 10x tables.	**Doubling:** Children should be able to double each whole number to 10 (recall). For higher numbers, children should begin to use their knowledge of place value to partition, double each digit and then recombine. 22 40 + 4 = 44 46 80 + 12 = 92	**Counting by rote:** Children can use knowledge of the inverse to find division facts. **Example:** 40 ÷ 10 = 4 Use fingers to count in groups of 10 until you reach 40. How many groups did they count? This strategy should be used for known tables (2x, 5x and 10x in KS1).	**Halving:** Children should be able to half each even number to 20 (recall). For higher numbers, children should begin to use their knowledge of place value to partition, half each digit and then recombine (focus on even numbers to 100). 22 10 + 1 = 11 98 45 + 4 = 49

Written Methods	**Repeated Addition:** Solve through repeated addition. e.g. There are 4 apples in a box. How many apples in 3 boxes?	**Arrays:** Use arrays to create pictures of a multiplication problem. e.g. There are 4 apples in a box. How many apples in 3 boxes?	**Sharing:** Use arrays to create pictures of a division problems. e.g. 12 ÷ 3 =	**Grouping:** Use grouping to divide large numbers by a single digit. e.g. 363 ÷ 3 =

Calculation Policy: LKS2

Y3	Y4
• multiplication and division facts for the 3, 4 and 8 X tables • through doubling, connect the 2, 4 and 8 multiplication tables	• multiplication and division facts for multiplication tables up to 12 × 12 • recognise and use factor pairs and commutativity in mental calculations

Yr 3 - Calculations (NC Links):
• Pupils now use multiples of 2, 3, 4, 5, 8, 10, 50 and 100 when calculating.
• Pupils should be taught to add and subtract numbers mentally, including:
    - a three-digit number and ones
    - a three-digit number and tens
    - a three-digit number and hundreds
• Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.
	Yr 4 - Calculations (NC Links):
	•Show precision and fluency in their work.
	•Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.
	•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
	•Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

	Addition		**Subtraction**	
Mental Calculation Strategies	Addition of a single digit number by counting on (possibly using fingers for support). Children put the big number in their head and count on the number of places indicated by the smaller number $17 + 9 = 26$	Addition of a 2-digit number, using partitioning. First add the tens and then add the units. $26 + 18 =$ 26 + 10 = 36 36 + 8 = 44	Subtraction of a single digit number by counting back (possibly using fingers to support). Children put the big number in their head and count the number of places indicated by the smaller number. $18 - 7 = 11$	Subtraction of a 2-digit number, using partitioning. First subtract the tens and then subtract the units. $26 - 14 = 12$ 26 - 10 = 16 16 - 4 = 12

Written Methds	Addition of two numbers horizontally by partitioning the smaller number into Maltesers and counting 'on' (putting the biggest number first)	Column Addition: add the numbers by organising in columns. Top tips: 1) Line up your digits. 2) Carry your digits at the top. 3) Line up your decimals.	Subtraction of two numbers horizontally by partitioning the larger number into Maltesers, crossing out the number to be taken away (beginning at the bottom) and then counting all that are 'left'.	Column Subtraction: subtract the numbers by organising in columns. Top tips: 1) Line up your digits. 2) Borrow from your Neighbor. 3) Line up your decimals.

Column Addition:

$$\begin{array}{r} 1 \\ 721 \\ +\ 209 \\ \hline 930 \end{array}$$

Subtraction horizontally:

$$6 - 5 =$$

$$9 - 3 - 6 =$$

Column Subtraction:

$$\begin{array}{r} 6 \\ \cancel{7}29 \\ -\ 569 \\ \hline 160 \end{array}$$

	Multiplication		**Division**	
Mental Calculation Strategies	**Counting by rote:** Children can count from 0 in 4s, 8s, 50s and 100s (Yr3) and count from 0 in 6s, 7s, 9s, 25s and 1000 (Yr4). Children can also count by rote using fingers to group in groups. Times tables: Know by heart the facts for the 2x, 3x, 4x, 5x, 8x and 10x tables (Yr3). By the end of Yr4, children should know by heart the facts for all tables up to x12.	**Doubling:** Children should be able to double each whole number to 100. For higher numbers, children should begin to use their knowledge of place value to partition, double each digit and then recombine. 22 40 + 4 = 44 46 80 + 12 = 92	**Counting by rote:** Children can use knowledge of the inverse to find division facts. Example: $40 \div 10 = 4$ Use fingers to count in groups of 10 until you reach 40. How many groups did they count? This strategy should be used for known tables (2x, 3x, 4x, 5x, 8x and 10x in Yr3). It should be used for all tables to x12 in Yr4.	**Halving:** Children should be able to half each number to 100. For higher numbers, children should begin to use their knowledge of place value to partition, half each digit and then recombine (focus on even numbers to 100). 22 10 + 1 = 11 98 45 + 4 = 49
Written Methods	**Arrays:** Use simplified illustrations (arrays of Maltesers) to create pictures of a multiplication problem. E.g. There are 4 apples in a box. How many apples in 3 boxes? ARRAY 3 4	Short Multiplication: children need to use the multiplication tables they know to solve 2/3-digit numbers times 1-digit numbers. (They should progress from mental methods to formal written methods). 28 x 4 112	**Arrays and Grouping:** Use simplified illustrations (arrays of Maltesers) to create pictures of a division problems. Arrays – sharing: $12 \div 3 = $ **Grouping:** 100 20 1 100 20 1 100 20 1 $363 \div 3 = $	**Short Division (bus stop):** Children should use known multiplication tables to solve 2/3-digit numbers divided by 1 digit. (They should progress from mental methods to formal written methods). 5 6 4 2 2 ²4

Calculation Policy: UKS2	

Y5	**Y6**
Multiply and divide numbers mentally drawing upon known facts	Use all the multiplication tables to calculate mathematical statements.
Yr 5 - Calculations (NC Links): • Add and subtract whole numbers with more than 4 digits, including mentally and using formal written methods (columnar addition and subtraction). • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. • Divide numbers up to 4 digits by a one-digit number using the formal written method of short division Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	Yr 6 - Calculations (NC Links): • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Divide numbers up to 4 digits by a two-digit number using the formal written method of short division

	Addition	**Subtraction**
Mental Calculation Strategies	Addition of a 2/3-digit number, using partitioning. First add the hundred, tens and then add the units.	Subtraction of a 2/3-digit number, using partitioning. First subtract the hundreds, then the tens and then the units.

Written Methods	Column Addition: add the numbers by organising in columns. Top tips: 1) Line up your digits. 2) Carry your digits at the top. 3) Line up your decimals.	$$\begin{array}{r} 1 \\ 721 \\ +\ 209 \\ \hline 930 \end{array}$$		Column Subtraction: subtract the numbers by organising in columns. Top tips: 1) Line up your digits. 2) Borrow from your neighbour. 3) Line up your decimals.	$$\begin{array}{r} 6 \\ \cancel{7}^{1}29 \\ -\ 569 \\ \hline 160 \end{array}$$
	Multiplication			**Division**	
Mental Calculation Strategies	**Doubling:** Children should be able to double each whole number to 1000. For higher numbers, children should begin to use their knowledge of place value to partition, double each digit and then recombine. 22 40 + 4 = 44 46 80 + 12 = 92	**Mental multiplication using partitioning:** 17 x 5 = 10 x 5 = 50 7 x 5 = 35 50 + 35 = 85		**Halving:** Children should be able to half each number to 1000. For higher numbers, children should begin to use their knowledge of place value to partition, half each digit and then recombine (focus on even numbers to 100). 22 10 + 1 = 11 98 45 + 4 = 49	

| Written Methods | **Short Multiplication:**

se the multiplication tables they know to solve 2-digit numbers times 1-digit numbers (they should progress from mental methods to formal written methods).

$$\begin{array}{r} \cancel{2} \\ 28 \\ \times \ \ 4 \\ \hline 112 \\ \hline \end{array}$$ | **Long Multiplication:**

Use long multiplication to multiply up to 4-digits by a 2-digit number.

Top Tips:
Line up the digits
Carry at the top –
cross out the digits
you have carried to
avoid adding them
Twice.

$$\begin{array}{r} 1 \\ \cancel{1}\cancel{2} \\ 124 \\ \times \ \ \ 35 \\ \hline {}_1620 \\ 3\,720 \\ \hline 4340 \\ \hline \end{array}$$ | **Short Division (bus stop):**

Children should use known multiplication tables to solve 2/3-digit numbers divided by 1 digit.

(They should progress from mental methods to formal written methods).

$$4\overline{\smash{\big)}\,2\,2\,{}^2\!4} = 56$$ |

National Curriculum Aims:

The national curriculum for mathematics aims to ensure that all pupils:
- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.
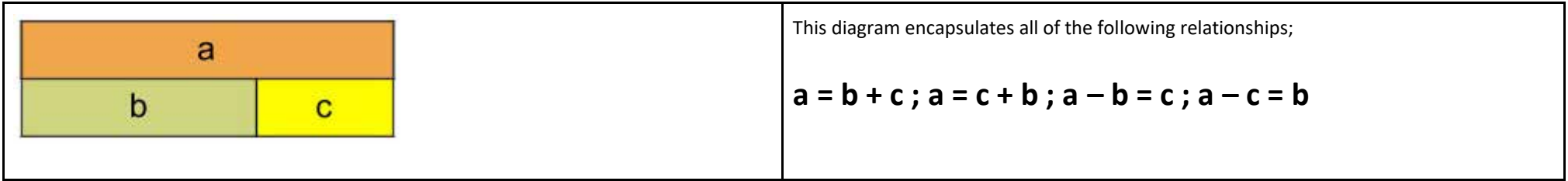
Problem Solving – A Guide to Using Bar Modelling

The Bar Model – information from the NCETM website

The bar model is used in Singapore and other countries, such as Japan and the USA, to support children in problem solving. It is not a method for solving problems, but a way of revealing the mathematical structure within a problem and gaining insight and clarity as to how to solve it. It supports the transformation of real life problems into a mathematical form and can bridge the gap between concrete mathematical experiences and abstract representations. It should be preceded by and used in conjunction with a variety of representations, both concrete and pictorial, all of which contribute to children's developing number sense. It can be used to represent problems involving the four operations, ratio and proportion. It is also useful for representing unknowns in a problem and as such can be a precursor to more symbolic algebra.

Addition and Subtraction

The bar model supports understanding of the relationship between addition and subtraction in that both can be seen within the one representation and viewed as different ways of looking at the same relationships.

This diagram encapsulates all of the following relationships;

$$a = b + c \; ; \; a = c + b \; ; \; a - b = c \; ; \; a - c = b$$

Multiplication, Division, Fractions, and Ratio

All of these concepts involve proportional and multiplicative relationships and the bar model is particularly valuable for representing these types of problems and for making the connections between these concepts visible and accessible.

Problem solving should move from practical equipment to abstract numbers and symbols:

Concrete

$$3 + 2 =$$

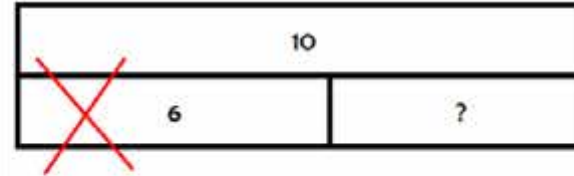$$3 + 2 =$$
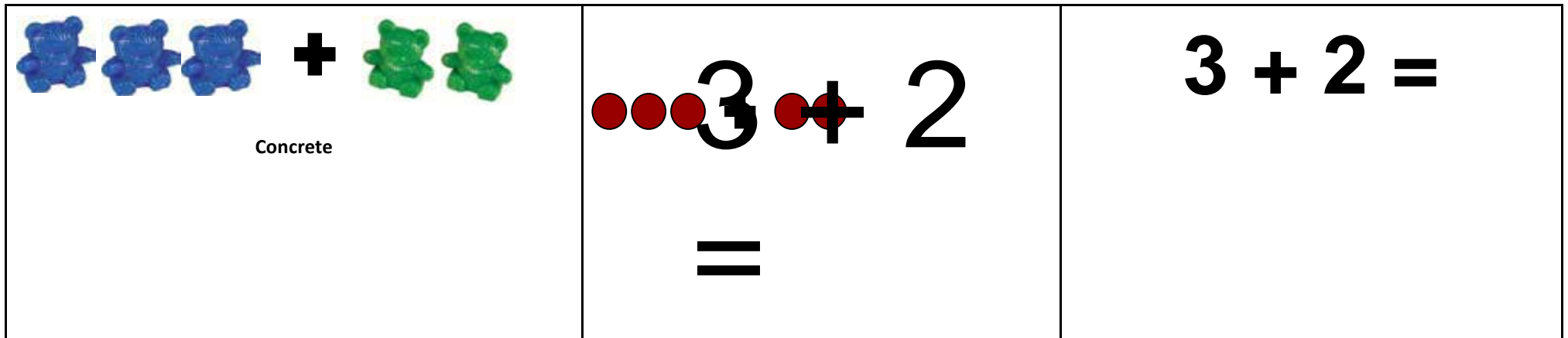
NCETM question examples Year 1:

Ebony has 5p and Daniel has 8p.
How much do they have altogether?

$5 + 8 = 13$

5	8

A Lolly costs 6p. Armit pays with a 10p coin.
How much change does he get?

$10 - 6 = 4$

10	
6	?

Michael says that 16 + 5 = 21
Is he correct?

$16 + 5 = 21$

21	
16	5
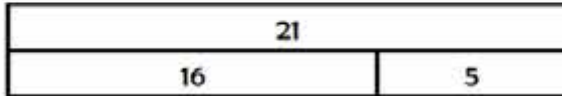
I think of a number. I subtract 5. The answer is 4.
What is my number?

$5 + 4 = 9$

My Number ...

?	
5	4

I have subtracted ...   I am left with ...
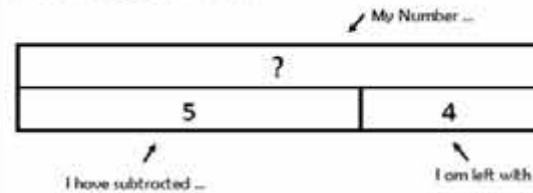
Twelve people are split into two groups.
How many are in each group?

$12 ÷ 2 = 6$

12
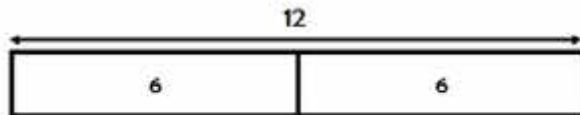
6	6

Mrs Morton puts five 5p coins in her purse.
How much is in her purse altogether?

$5 + 5 + 5 + 5 + 5 = 25$

5	5	5	5	5

$5 × 5 = 25$

49
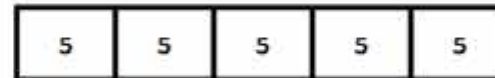
Dylan has 37 coloured pencils and he buys 30 more.

How many does he have now?

?	
37	30

$37 + 30 = 67$

Janie has 40 beads. She loses 25 of them.

How many does she have now?

$40 - 25 = 15$

40	
25	?

What is the difference between seventy-six and thirty-five?

$76 - 35 = 41$

76	
35	?

Mr Siddique shares £18 equally between his three sons.

How much does each son get?

$£18 \div 3 = £6$

18		
6	6	6

Amelia writes the calculation below as a multiplication calculation? What might she write?

$3 + 3 + 3 + 3 + 3 = 15$

$5 \times 3 = 15$

3	3	3	3	3

Charlotte-May had to find a $\frac{1}{4}$ of a number.

Her answer was 4. What number did she start with?
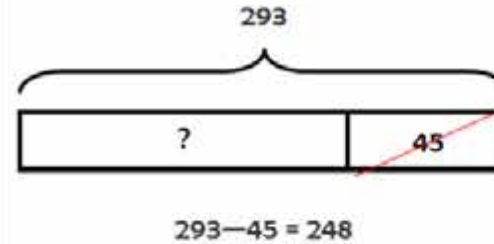
$4 \times 4 = 16$

4	4	4	4

$\frac{1}{4}$

Year 3:

There are 334 children at Springfield School and 75 at Holy Trinity Nursery. How many children are there altogether?

Springfield School   Holy Trinity Nursery

| 334 | 75 |

$334 + 75 = 409$
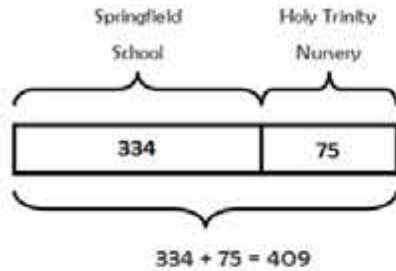
Gemma collected 293 badges but she gave 45 of them to her friend, Rebecca. How many badges did she have left?

293

| ? | 45 |

$293 - 45 = 248$

Aiden has seven marbles and Harvey has fifteen. They decide to share them equally between them. How many do they get each?

Harvey   Aiden

| 15 | 7 |

$15 + 7 = 22$
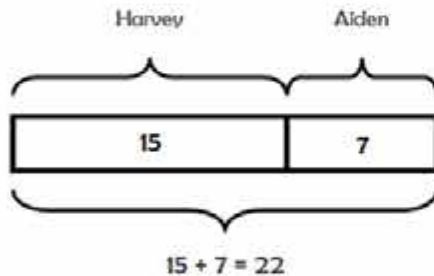
If five apples cost fifty pence, how much would two apples cost?

5 apples = 50p

| 10p | 10p | 10p | 10p | 10p |

2 Apples?
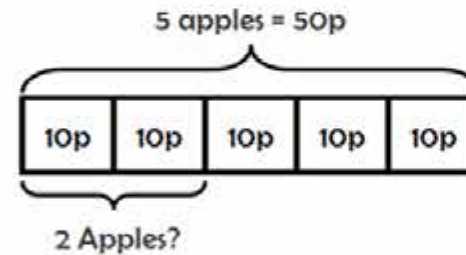
$50 \div 5 = 10$

$$\begin{array}{r} 1\ 0 \\ 5\overline{)5\ 0} \end{array}$$

$2 \times 10p = 20p$

A bookcase in the library holds 5 shelves with 46 books on each shelf. How many books are there in the bookcase altogether?

5 shelves = 46 x 5

| 46 | 46 | 46 | 46 | 46 |

1 shelf
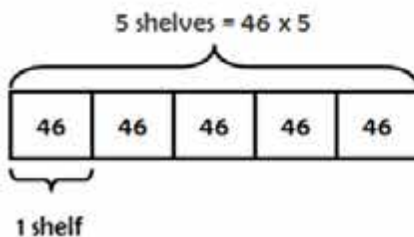
$$\begin{array}{r} 4\ 6 \\ \times\quad 5 \\ \hline 2\ 3\ 0 \end{array}$$

A computer game is £24 in the sale. This is one quarter off its original price. How much did it cost before the sale?

$\frac{1}{4}$

| 24 | 24 | 24 | 24 |

$\frac{4}{4}$

$1 = 24$
$\frac{}{4}$
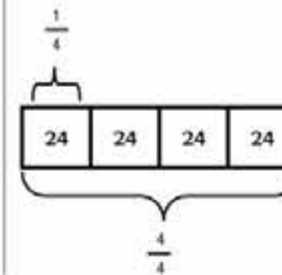
$4 = 24$
$\frac{}{4}$

$$\begin{array}{r} 24 \\ \times\ 4 \\ \hline 96 \end{array}$$

Year 4:

Martin has saved £6.78 and spends £4.69. How much does he have left?

£6.78	
£4.69	?

£6.78 - £4.69 = £2.09

Sally has 40 football cards. She gives 2/5 of them away.
How many does she gives away?

Sally = 40 football cads

8	8	8	8	8

$\frac{2}{5}$

40 ÷ 5 = 8

2 x 8 = 16 cards
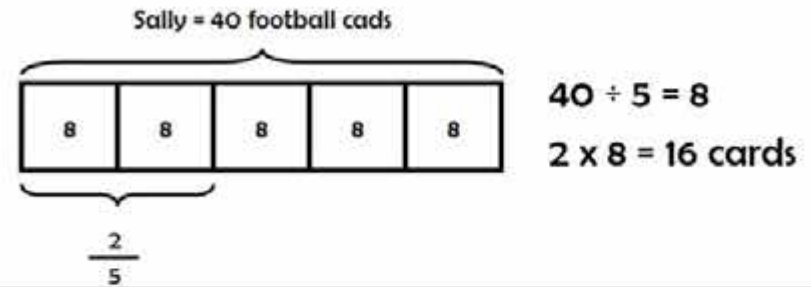
The table shows the cost of a new football kit:

£8.75

£5.95 £4.15

Item	Cost
Shirt	£8.75
Shorts (1 pair)	£5.95
Socks (1 pair)	£4.15

Altogether, how much does the complete football kit cost?

Total cost of football kit

Shirt £8.75	Shorts £5.95	Socks £4.15
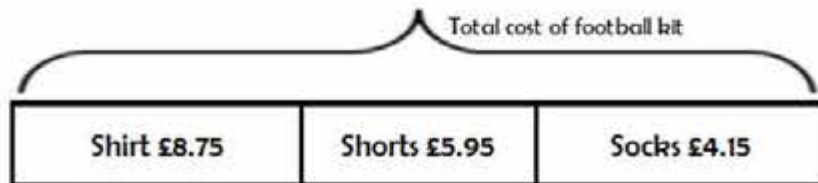
Total cost of football kit = £8.75 + £5.95 + £4.15 = £18.85

Ben cuts a pizza into 8 equal pizzas.

Ben eats $\frac{5}{8}$ and Sue eats $\frac{1}{8}$ of the pizza.

What fraction of the pizza is left?

5/8 eaten by Ben

1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8

1/8 eaten by Sue

Year 5:

Every day for 4 days Helen scored 7.5 in a test. On the fifth day she scored 8. What was her total score?

Day 1	Day 2	Day 3	Day 4	Day 5
7.5	7.5	7.5	7.5	8
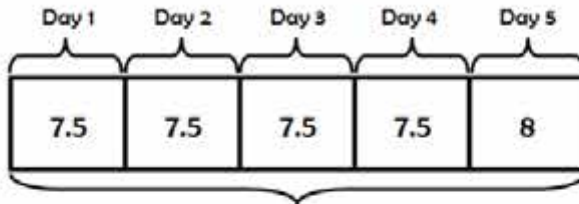
Total score = 7.5 + 7.5 + 7.5 + 7.5 + 8 = 38

A computer game is reduced in a sale by 30%. Its reduced price is £77. How much was the original price?

£77   30%

						10%	10%	10%

£77 ÷ 7 = £11

£11 x 10 = £110.00

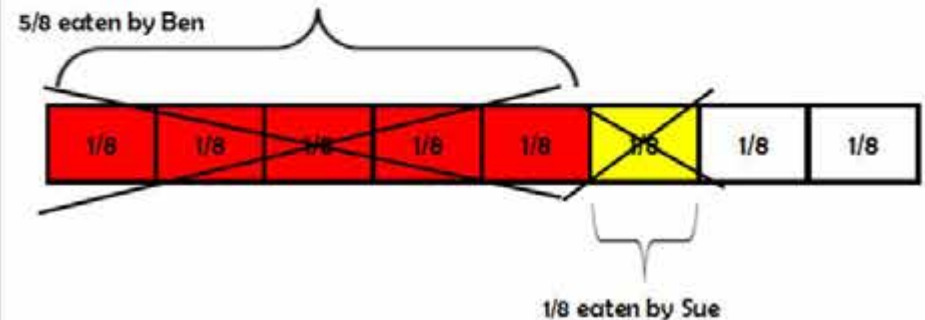| Big Wheel	Rollercoaster
£2.50 each ride	£1.50 each ride

Liam spends £14 altogether on the Big Wheel and the Rollercoaster.

He goes on the Big Wheel twice.

How many times does he go on the Rollercoaster?

Total cost = £14

Big wheel £2.50	Big wheel £2.50	Rollercoaster cost = ?

Big Wheel: £2.50 x 2 = £5.00

Money spent on the Rollercoaster:
£14.00 - £5.00 = £9.00
£9.00 ÷ £1.50 = 6 rides on the rollercoaster

On Saturday Lara read $\frac{2}{5}$ of her book.

On Sunday she read the **other** 90 pages to finish the book.

How many pages are there in Lara's book?

$\frac{2}{5}$ Read on Saturday   Sunday = $\frac{3}{5}$ 90 pages

30	30	30	30	30
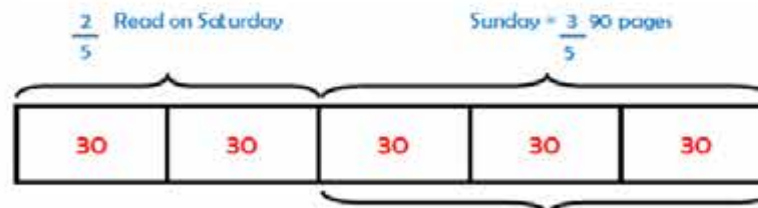
So 90 ÷ 3 = 30

Therefore 1/5 = 30

In total, Lara read the whole book (5/5).

Therefore ... 30 x 5 = 150 pages

53

Year 6:

Three quarters of a number is 54. What is the number?

$$\frac{3}{4} = 54$$

| 18 | 18 | 18 | 18 |

$$\frac{4}{4} = 72$$

Step 1 =

$$\frac{3}{4} = 54$$

$$3\overline{)54} = 18$$

Step 2 =

$$\begin{array}{r} 18 \\ \times \quad 4 \\ \hline 72 \end{array}$$

A shop sells magazines and comics. Freya buys a magazine and a comic. She pays £2·50. Evie buys a magazine and two comics. She pays £3·90. How much does a comic cost? How much does a magazine cost?

Freya = £2.50

| Magazine | Comic |

| Magazine | Comic | Comic |

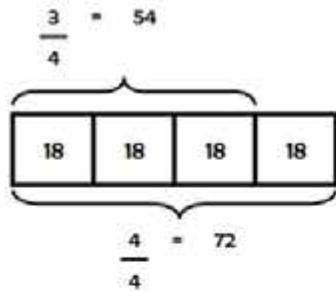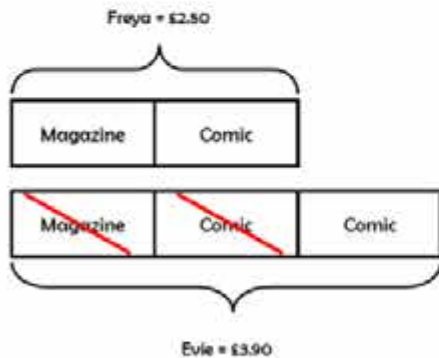$$\begin{array}{r} £3.90 \\ - \quad £2.50 \\ \hline £1.40 = 1\ comic \end{array}$$

Evie = £3.90

| Magazine | Comic | = £2.50

? + £1.40 = £2.50
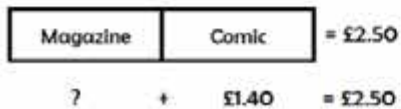
$$\begin{array}{r} £2.50 \\ - \quad £1.40 \\ \hline £1.10 = 1\ Magazine \end{array}$$

Maria bakes cakes and sells them in bags.

She uses this formula to work out how much to charge for one bag of cakes.

Cost = number of cakes × 20p + 15p for the bag

How much will a bag of 12 cakes cost?

Total cost

| 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 15 |

£240 + 15 = £2.55
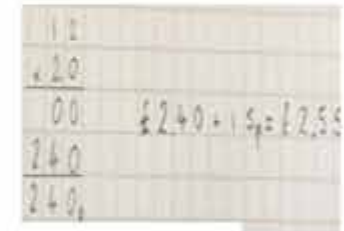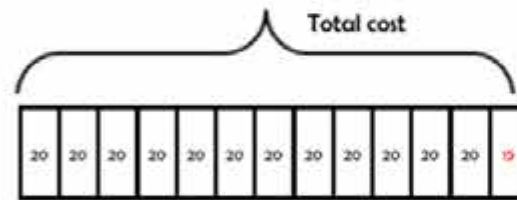
Olivia buys a bag of cakes for £5.15.

Use the formula to calculate how many cakes are in the bag.

£5.15

Cost of cakes

? × 20

£5.15 - 15 = £5.00

$$20\overline{)5.00} = 0.25$$ 25 cakes

54
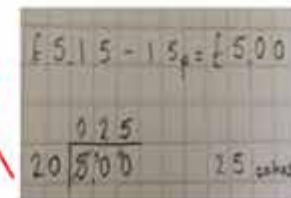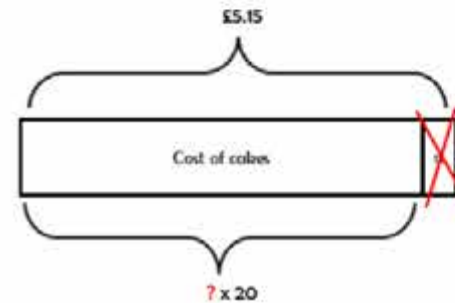
Maths Mania Overview

Maths Mania forms part of our mathematics curriculum and specifically focuses on the development of mental calculation skills through the rapid recall of mathematical facts. As part of Maths Mania, all children will be required to learn, by heart, key 'maths facts' which they can recall quickly and accurately.

The accurate recall of key mathematical facts supports children's ability to calculate fluently. This is particularly useful when children are adding, subtracting, multiplying or dividing. The learning of mathematical facts requires constant practice and rehearsal.

What is Maths Mania?

Each half-term, children will have a set of mathematical facts to learn - these facts have been organised into three categories: bonds / number, multiplication and fractions, decimals and percentages (FDP). The facts children are required to learn are detailed in the 'objectives overview' document and are organised by Key Phase.

Throughout each half-term, children will practise these facts at the start of maths lessons and through their participation in Maths Mania challenges on Frog Play. They will be set three Maths Mania challenges on Frog Play - one for each strand of the overview. The challenges have been created in Frog Play and class teachers should assign the challenges to their class at the start of each half-term. Class teachers should monitor engagement with these challenges and ensure all learners are given weekly opportunities to try the challenges. At the end of each half-term, children will receive a certificate of achievement for their participation in these challenges (showing their % score for each strand). In addition, each half-term, each class will nominate maths champions from their class to win one of the following awards.

- Times Tables Champion: for excellent times tables recall.
- Human Calculator: for consistent accuracy in the recall of these facts.
- Hero of the Hours: for putting in the practice and not giving up!

The ultimate aim is for children to be able to recall these facts instantly!

Maths Mania Objectives Overview:

FS	A1	A2	SP1	SP2	SU1	SU2
Bonds	Bonds to 10	Bonds to 10	Bonds to 20	Bonds to 20	Bonds - Multiples of 10 to 100	Bonds - Multiples of 10 to 100
Multiplication	x2	x2 x10	x2 x5 x10	x2 x5 x10	X2 x5 x10 x3	X2 x5 x10 x3
FDP	Double 10	Half 10	Double 20	Half 20	Double - multiples of 10 to 100	Double - multiples of 10 to 100

KS1	A1	A2	SP1	SP2	SU1	SU2
Bonds	Bonds to 20	Bonds to 20	Bonds - Multiples of 10 to 100	Bonds - Multiples of 10 to 100	Bonds - Multiples of 100 to 1000	Bonds - Multiples of 100 to 1000
Multiplication	x2 x5 x10 x3 x6	x2 x5 x10 x4 x8	x2 x5 x10 x3 x6 x4 x8	x2 x5 x10 x3 x6 x4 x8 x7	x2 x5 x10 x3 x6 x4 x8 x11	x2 x5 x10 x3 x6 x4 x8 x11
FDP	Double / half 20	Double / half 20	Double / half - multiples of 10 to 100	Double / half - multiples of 10 to 100	Double / half - multiples of 100 to 1000	Double / half - multiples of 100 to 1000

LKS2	A1	A2	SP1	SP2	SU1	SU2
Number	Bonds - Bonds to 10 Multiples of 10 to 100	Bonds - Multiples of 100 to 1000	Bonds to 1 (1dp)	Rounding - 10	Rounding - 100	Rounding - 1000
Multiplication	x2 x5 x10 x3 x6 x4 x8 x11 x7	x2 x5 x10 x3 x6 x4 x8 x11 x7	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9 x12	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9 x12
FDP	Double / half: 1 - 10 (m) 10 to 100	Double / half: 1 - 10 (m) 10 to 100	Double / half - multiples of 100 to 1000	Double / half - multiples of 100 to 1000	Equivalent FDP: 0.25 / 0.5 / 0.75 / 1	Equivalent FDP: 0.25 / 0.5 / 0.75 / 1

UKS2	A1	A2	SP1	SP2	SU1	SU2
Number	Rounding: 10 / 100 / 1000	Rounding: to 1,000,000	Prime Numbers 101	Prime Numbers 101	Equivalents: measures	Equivalents: measures
Multiplication	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9 x12	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9 x12	Square numbers to 12	Square numbers to 12	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9 x12	x2 x5 x10 x3 x6 x4 x8 x11 x7 x9 x12
FDP	Equivalent FDP - Quarters / Thirds	Equivalent FDP - Quarters / Thirds	Equivalent FDP - TENTHS	Equivalent FDP - TENTHS	Equivalent FDP - Quarters, Thirds and Tenths	Equivalent FDP - Quarters, Thirds and Tenths

KS2 Arithmetic

Throughout KS2, children will be taught formal written methods through additional arithmetic sessions each week. This will enable pupils to master arithmetic skills, which can then be readily applied during maths lessons. Progression in arithmetic is mapped and complements progression built into maths blocks.

LKS2		
Week 1	2/3/4 digit numbers add 1 & 10	**Autumn 1**
Week 2	2/3/4 digit numbers add 1 & 10 & 100	
Week 3	Column Addition - no exchange (Y3 - 3-Digit & Y4 4-Digit)	
Week 4	Column Addition - exchange (Y3 - 3-Digit & Y4 4-Digit)	
Week 5	Column Addition - exchange (Y3 - 3-Digit & Y4 4-Digit)	
Week 6	Addition 3 numbers	
Week 7	2/3/4 digit numbers subtract 1 & 10	**Autumn 2**
Week 8	2/3/4 digit numbers subtract 1 & 10 & 100	
Week 9	Column Subtraction - no exchange (Y3 - 3-Digit & Y4 4-Digit)	
Week 10	Column Subtraction - exchange (Y3 - 3-Digit & Y4 4-Digit)	
Week 11	Column Subtraction - exchange (Y3 - 3-Digit & Y4 4-Digit)	
Week 12	The inverse (missing numbers - part/part/whole)	
Week 13	The inverse (missing numbers - part/part/whole)	**Spring 1**
Week 14	The inverse (missing numbers - part/part/whole)	
Week 15	Decimal Addition (1dp)	
Week 16	Decimal Subtraction (1dp)	
Week 17	The inverse with decimals (missing numbers - part/part/whole)	
Week 18	The inverse with decimals (missing numbers - part/part/whole)	
Week 19	Short multiplication - 2 / 3 / 5	**Spring 2**
Week 20	Short multiplication - 2 / 3 / 4 / 5 / 6 / 8	
Week 21	Short multiplication - 2 / 3 / 4 / 5 / 6 / 8	
Week 22	Multiplication by 10	
Week 23	Multiplication - multiples of 10 (using known facts)	
Week 24	Multiplication 3 numbers - within known tables	
Week 25	Short division - 2 / 3 / 5	**Summer 1**
Week 26	Short division - 2 / 3 / 4 / 5 / 6 / 8	

Week 27	Short division - 2 / 3 / 4 / 5 / 6 / 8	
Week 28	Division by 10	
Week 29	Division - multiples of 10 (using known facts)	
Week 30	Multiplication / Division - missing numbers	
Week 31	Fractions - Addition	**Summer 2**
Week 32	Fractions - Addition	
Week 33	Fractions - Addition	
Week 34	Fractions - Subtraction	
Week 35	Fractions - Subtraction	
Week 36	Fractions - Subtraction	

UKS2		
Week 1	Addition and Subtraction	**Autumn 1**
Week 2	Addition and Subtraction with missing numbers (any order)	
Week 3	Addition and Subtraction with decimals (inc. compliments to 1)	
Week 4	Short Multiplication	
Week 5	Long Multiplication	
Week 6	Short Division (Bus Stop)	
Week 7	Long Division (Bus Stop)	
Week 8	Multiplication - 10/100/1000	**Autumn 2**
Week 9	Division - 10/100/1000	
Week 10	Multiplication - square, cube and 3 numbers	
Week 11	Multiplication - 3 numbers	
Week 12	Order of Operation – using square / cube numbers with addition and subtraction.	
Week 13	Order of operation – the four operations	
Week 14	Addition and Subtraction - Decimals	**Spring 1**
Week 15	Addition and Subtraction - Decimals (missing numbers)	
Week 16	Multiplication - Decimals	
Week 17	Multiplication - Decimals	
Week 18	Division - Decimals	
Week 19	Division - Decimals	

Week 20	Addition and Subtraction - Proper Fractions	**Spring 2**
Week 21	Addition and Subtraction - Mixed Numbers	
Week 22	Multiplication - single fraction	59
Week 23	Multiplication - 2 fractions	
Week 24	Division - fraction by whole number	
Week 25	Fraction of a number recap	
Week 26	Percentages of a number	**Summer 1**
Week 27	Percentage x by a number	
Week 28	SATS!!!	
Week 29	Y5 - Addition & Subtraction	
Week 30	Y5 - Addition & Subtraction - Missing Numbers	
Week 31	Y5 - Addition and Subtraction - Decimals	
Week 32	Y5 - Multiplication	**Summer 2**
Week 33	Y5 - Multiplication - Missing Numbers	
Week 34	Y5 - Division	
Week 35	Y5 - Division - Missing Numbers	
Week 36	Y5 - Four Operations - Proper Fractions	
Week 37	Y5 - Four Operations - Proper Fractions	