Mathematics

Intent

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

At Longthorpe Primary School, we strive to develop confident and curious mathematicians who have a positive self-belief and are willing to take risks, understanding that mistakes contribute to learning opportunities and therefore success. All of our staff aim to inspire and enthuse our mathematics learners and celebrate their perseverance and foster a positive growth mind-set. In class, our active learners are encouraged to collaborate through effective communication and exacting vocabulary, allowing them to reason and explain their systematic thinking. To inspire confident mathematicians, we aim to develop pupils' number sense so that they can manipulate numbers, make links with new learning and spot patterns. Our mathematics curriculum has been designed to enable our pupils to:

- become fluent in the fundamentals of mathematics, so that they 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.
- 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.

Implementation

At Longthorpe Primary School, we use the mastery approach to learning and teaching maths - utilising the Primary Advantage Maths (PAM) tool. We have chosen this tool as it has been devised by a specialist maths team and the backbone of this curriculum is the spiralling of maths strands, where each revisit builds on prior learning in small but stretching steps resulting in coherent learning that sticks. The mastery approach is characterised by the belief that by working hard all pupils can succeed at maths – and that maths can and should be an inclusive subject for all. At the core of our curriculum is the 'Concrete – Pictorial – Abstract' (CPA) approach; learning that is supported and scaffolded with concrete manipulatives or pictorial representations to ensure pupils gain a depth of mathematics understanding. Pupils move onto abstract recording when they are ready (e.g., the standardised method of long division) so they have firm conceptual foundations around the area of maths being taught.

Through our curriculum, pupils gain a rapid accurate recall of number facts after explicit input from teachers and a variety of fluency practise tasks. Where possible, maths units are linked to real life and purposeful processes and outcomes so that our pupils can see how relevant maths is in the 'real world'. In our classes, learners feel safe to make mistakes and get stuck because we ensure there is a strong culture of error. Teachers will often pre-teach potential misconceptions and advise on barriers to learning and they will explicitly teach subject specific vocabulary. The teaching and learning expectations across each maths module include:

- Collaborative learning with frequent dedicated pupil talk time.
- Conceptual variation through mathematical structures (concrete and pictorial).
- Procedural variation so that pupils use patterns and adjustments for efficient calculation.
- Coherence and continuity so the same methods are taught and built on throughout the mathematics curriculum.

The PAM curriculum ensures that deliberate links are made between differing strands of maths so that these strands are not taught in isolation. For example, the teaching of the concept of 'measure' incorporating addition and subtraction skills. Additionally, the DfE 'Ready to Progress' objectives

are woven into our PAM curriculum and are taught throughout the year. This ensures that priority is given to the key objectives which are needed in each year to allow a secure foundation for the next year's learning.

At the beginning of a mathematics unit, a diagnostic activity is carried out to illicit prior knowledge and any misconceptions being displayed. Any misconceptions are then woven into the unit planning to ensure they are addressed within teaching. The first session is usually an exploration session, which focuses on key vocabulary for the unit and key concepts, which are explored with a range of manipulatives. Talk partners are a fundamental element of the sessions where discussion is encouraged and there is an expectation that all pupils will be able to share their ideas about their learning. As the unit progresses, learning will be deepened for those who are ready to move on through reasoning, application, explanation and problem-solving activities. They may also be seen as 'experts' supporting and modelling' their understanding for pupils who need it. As part of the mastery approach, scaffolding and support will be offered to those pupils who need it. For example, the continuation of the use of manipulatives or sentence stems. Most pupils with SEND will access the maths curriculum with their peers.

Times Tables

When introducing a new times table fact, a 2-week approach is taken. Initially counting forwards and backwards along a counting stick and seeing the relationship between the multiples. Once the majority are confident with this, the facts are displayed as a mountain, with safe zones created as their 'go-to' facts. Multiplication and division are taught simultaneously at this time. When pupils are confident and able to explain their strategies, speed is developed with 'practise' sessions and other facts are linked with scaling up and scaling down questions for those who are able. 'Times Table Rockstars' is also being used to allow pupils to practise their fluency in school and at home.

Calculating Mentally

Number bonds are a key focus throughout the school. All pupils from EYFS to Year 6 have half-termly targets to work on. We know that for a proportion of our pupils, there are gaps in their number foundations and therefore struggle to see links to new learning. For example, adding 3 multiples of a hundred is difficult if you are not able to fluently add 3 single digit numbers. Number Talks (Sherry Parrish) have been introduced across the whole school and are continuing to be developed. This allows our pupils to be flexible thinkers and expert communicators as well as building computation skills and reinforcing number sense. The pupils are expected to talk about the range of strategies rather than seeing just one answer.

The Journey of a Mathematician at Longthorpe

EYFS	By the end of the EYFS, pupils 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. count reliably with numbers from one to 20.
KS1	By the end of KS1, pupils will: • Develop confidence and mental fluency with whole numbers, counting and place value. This will involve working with numerals, words and the four operations, including with practical resources. • Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. • Describe and compare different quantities such as length, mass, capacity/volume, time and money. • Know the number bonds to 20 and be precise in using and understanding place value. • Read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at KS1.
LKS2	By the end of Lower KS2, pupils will: • Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. • Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. • Develop their ability to solve a range of problems, including with simple fractions and decimal place value. • Draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. • Use measuring instruments with accuracy and make connections between measure and number. • Have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work. • Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

UKS2	By the end of Upper KS2, pupils will: • Extend their understanding of the number system and place value to include larger integers. • Develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. • Develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. • Be introduced to the language of algebra as a means for solving a variety of problems. • Consolidate and extend knowledge developed in number and link to geometry and measures. • Classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. • Be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. • Read, spell and pronounce mathematical vocabulary correctly.

Units Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Pupils will build on previous experiences of number from their home and nursery environments, and further develop their subitising and counting skills. They will explore the composition of numbers within 5. They will begin to compare sets of objects and use the language of comparison. Pupils will: • identify when a set can be subitised andwhen counting is needed • subitise different arrangements, both unstructured and structured, including using the Hungarian number frame • make different arrangements of numbers within 5 and talk about what they can see, to develop their conceptual subitising skills • spot smaller numbers 'hiding' inside larger numbers connect quantities and numbers to finger patterns and explore different ways of representing numbers on their fingers • hear and join in with the counting sequence, and connect this to the 'staircase' pattern of the counting numbers, seeing that each number is made of one more than the previous number		Pupils will continue to develop their subitising and counting skills and explore the composition of numbers within and beyond 5. They will begin to identify when two sets are equal or unequal and connect two equal groups to doubles. They will begin to connect quantities to numerals. Pupils will: • continue to develop their subitising skills for numbers within and beyond 5, and increasingly connect quantities to numerals • begin to identify missing parts for numbers within 5 explore the structure of the numbers 6 and 7 as '5 and a bit' and connect this to finger patterns and the Hungarian number frame • focus on equal and unequal groups when comparing numbers • understand that two equal groups can be called a 'double' and connect this to finger patterns • sort odd and even numbers according to their 'shape' • continue to develop their understanding of the counting sequence and link cardinality and ordinality through the 'staircase' pattern • order numbers and play track games		Pupils will consolidate their counting skills, counting to larger numbers and developing a wider range of counting strategies. They will secure knowledge of number facts through varied practice. Pupils will: • continue to develop their counting skills, counting larger sets as well as counting actions and sounds • explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame • compare quantities and numbers, including sets of objects which have different attributes • continue to develop a sense of magnitude, e.g. knowing that 8 is quite a lot more than 2, but 4 is only a little bit more than 2 • begin to generalise about 'one more than' and 'one less than' number within 10 • continue to identify when sets can be subitised and when counting is necessary • develop conceptual subitising skills including when using a rekenrek	

	• develop counting skills and knowledge, including: that the last number in the count tells us 'how many' (cardinality); to be accurate in counting, each thing must be counted once and once only and in any order; the need for 1:1 correspondence; understanding that anything can be counted, including actions and sounds • compare sets of objects by matching • begin to develop the language of 'whole' when talking about objects which have parts		• join in with verbal counts beyond 20, hearing the repeated pattern within the counting numbers			
Year 1	Number and place value (3 weeks) Addition and Subtraction (3 weeks)	Number and place value (3 weeks) Addition and subtraction (with money and measurement) (3 weeks) Geometry (properties of shape) (1 week)	Number and place value (1 week) Addition and subtraction (2 weeks) Measurement (capacity and mass) (2 weeks) Addition and subtraction (with capacity and mass) (1 week)	Geometry (position and direction) (1 week) Measurement (time) (1 week) Addition and subtraction (2 weeks) Fractions (1 week)	Number and place value (1 week) Addition and subtraction (2 weeks) Addition and subtraction (with money) (1 week) Geometry (properties of shape) (1 week) Statistics (1 week)	Number and place value (1 week) Addition and subtraction (2 weeks) Multiplication and division (2 weeks) Fractions (1 week) Measurement (time) (1 week)

Year 2	Number and place value (2 weeks) Addition and subtraction (3 weeks) Measurement (time) (1 week)	Geometry (properties of shape) (1 week) Fractions (1 week) Multiplication and division (1 week) Statistics (1 week) Measurement (money) (1 week) Addition and subtraction (with money) (1 week)	Number and place value (1 (week) Addition and subtraction (2 weeks) Multiplication and division (2 weeks) Measurement (time) (1 week)	Measurement (length) (1 week) Addition and Subtraction (with length) (1 week) Multiplication and division (with length) (1 week) Fractions (1 week) Geometry (position and direction) (1 week)	Geometry (properties of shape) (1 week) Number and place value (1 week) Measurement (capacity and mass) (1 week) Addition and subtraction (with capacity and mass) (1 week) Multiplication and division (with capacity and mass) (1 week) Measurement (time) (1 week)	Measurement (length) (1 week) Four operations (with length) (2 weeks) Fractions (1 week) Statistics (1 week) Geometry (position and direction) (1 week) Four operations (with measurement) (1 week)
Year 3	Number and place value (2 weeks) Addition and subtraction (2 weeks) Multiplications and division (2 weeks)	Fractions, decimals and percentages (2 weeks) Geometry (1 week) Statistics (1 week) Measurement (volume and capacity)	Number and place value (1 week) Geometry (properties of shape) (1 week) Fractions, decimals and percentages (2 weeks)	Statistics (1 week) Measurement (money) (1 week) Four operations (with money) (1 week) Four operations (1 week)	Number and place value (1 week) Addition and subtraction (1 week) Multiplication and division (1 week)	Measure (volume and capacity) (1 week) Four operations (with volume and capacity) (1 week) Measure (length and mass) (1 week)

		(1 week) Measurement (length and mass) (1 week) Four operations (with measurement) (1 week)	Addition and subtraction (1 week) Multiplication and division (1 week)	Measurement (time) (1 week)	Fractions, decimals and percentages (3 weeks)	Four operations (length and mass) (1 week) Geometry (properties of shape) (1 week) Statistics (1 week) Measurement (time) (1 week)
Year 4	Number and place value (1 week) Addition and subtraction (2 weeks) Multiplication and division (2 weeks) Measurement (time) (1 week)	Fractions, decimals and percentages (2 weeks) Geometry (properties of shape) (1 week) Statistics (with addition and subtraction) (1 week) Measurement (length and mass) (1 week) Measurement (volume and capacity) (1 week)	Number and place value (1 week) Addition and subtraction (1 week) Multiplication and division (1 week) Fractions, decimals and percentages (2 weeks) Geometry (position and direction) (1 week)	Statistics (with addition and subtraction) (1 week) Measurement (money) (1 week) Four operations (with money) (1 week) Measurement (time) (1 week) Geometry (properties of shape) (1 week)	Number and place value (1 week) Addition and subtraction (1 week) Multiplication and division (1 week) Fractions, decimals and percentages (2 weeks) Geometry (position and direction) (1 week)	Measurement (volume and capacity) (1 week) Four operations (with volume and capacity) (1 week) Measurement (length and mass) (1 week) Four operations (with length and mass) (1 week) Geometry (properties of shape)

		Four operations (with measurement) (1 week)				(1 week) Statistics (with addition and subtraction) (1 week) Measurement (time) (1 week)
Year 5	Number and place value (2 weeks) Addition and subtraction (2 weeks) Multiplication and division (2 weeks) Four operations (1 week)	Fractions, decimals and percentages (2 weeks) Geometry (properties of shape) (1 week) Measurement (length and mass) (1 week) Measurement (volume and capacity) (1 week) Four operations (with volume, capacity, length and mass) (1 week) Statistics (1 week)	Number and place value (1 week) Addition and subtraction (1 week) Multiplication and division (1 week) Fractions, decimals and percentages (3 weeks)	Measurement (money) (1 week) Four operations (with money) (1 week) Measurement (time) (1 week) Geometry (position and direction) (1 week) Geometry (properties of shape) (1 week)	Number and place value (1 week) Addition and subtraction (1 week) Multiplication and division (1 week) Fractions, decimals and percentages (3 weeks)	Statistics (1 week) Geometry (position and direction) (1 week) Geometry (properties of shape) (1 week) Measurement (volume and capacity) (1 week) Measurement (length and mass) (1 week) Measurement (money) (1 week)

						Four operations (with measurement) (1 week)
Year 6	Number and place value (3 weeks) Addition and subtraction (with measures) (1 week) Multiplication and division (with measures) (2 weeks)	Fractions, decimals and percentages (2 weeks) Geometry (Properties of shapes) (1 week) Four operations (with measures) (1 week) Measures (Mass, capacity and volume) (1 week) Statistics (1 week)	Fractions, decimals and percentages (2 weeks) Multiplication and division (with measures) (1 week) Algebra (1 week) Four operations (with measures) (1 week)	Revision and review (2 weeks) Geometry (Position and direction) (1 week) Ratio and proportion (2 weeks)	Number and place value and four operations revision (1 week) Fractions, decimals and percentages revision (1 week) Geometry and measures revision (1 week) Algebra, ratio and proportion revision (1 week)	Theme Park Project (2 weeks) Enterprise Project (4 weeks) Consolidation and review (2 weeks)

Progression of Knowledge and Skills

	Reception			
	Subitising	**Cardinality, Ordinality & Counting**	**Composition**	**Comparison**
	• perceptually subitise within 3 • identify sub-groups in larger arrangements • create their own patterns for numbers within 4 • practise using their fingers to represent quantities which they can subitise • experience subitising in a range of contexts, including temporal patterns made by sounds. • continue from first half-term • subitise within 5, perceptually and conceptually, depending on the arrangements. • increase confidence in subitising by continuing to explore patterns within 5, including structured and random arrangements • explore a range of patterns made by some numbers greater than 5, including structured patterns in which 5 is a clear part • experience patterns which show a small group and '1 more' • continue to match arrangements to finger patterns. • explore symmetrical patterns, in which each side is a familiar pattern, linking this to 'doubles'. • continue to practise increasingly familiar subitising arrangements, including those which expose '1 more' or 'doubles' patterns • use subitising skills to enable them to identify when patterns show the same number but in a different	• relate the counting sequence to cardinality, seeing that the last number spoken gives the number in the entire set • have a wide range of opportunities to develop their knowledge of the counting sequence, including through rhyme and song • have a wide range of opportunities to develop 1:1 correspondence, including by coordinating movement and counting • have opportunities to develop an understanding that anything can be counted, including actions and sounds • explore a range of strategies which support accurate counting. • continue to develop their counting skills • explore the cardinality of 5, linking this to dice patterns and 5 fingers on 1 hand • begin to count beyond 5 • begin to recognise numerals, relating these to quantities they can subitise and count. • continue to develop verbal counting to 20 and beyond • continue to develop object counting skills, using a range of strategies to develop accuracy • continue to link counting to cardinality, including using their fingers to represent quantities between 5 and 10 • order numbers, linking cardinal and ordinal representations of number.	• see that all numbers can be made of 1s • compose their own collections within 4. • explore the concept of 'wholes' and 'parts' by looking at a range of objects that are composed of parts, some of which can be taken apart and some of which cannot • explore the composition of numbers within 5. • continue to explore the composition of 5 and practise recalling 'missing' or 'hidden' parts for 5 • explore the composition of 6, linking this to familiar patterns, including symmetrical patterns • begin to see that numbers within 10 can be composed of '5 and a bit'. • explore the composition of odd and even numbers, looking at the 'shape' of these numbers • begin to link even numbers to doubles • begin to explore the composition of numbers within 10. • explore the composition of 10.	• understand that sets can be compared according to a range of attributes, including by their numerosity • use the language of comparison, including 'more than' and 'fewer than' compare sets 'just by looking'. • compare sets using a variety of strategies, including 'just by looking', by subitising and by matching • compare sets by matching, seeing that when every object in a set can be matched to one in the other set, they contain the same number and are equal amounts. • continue to compare sets using the language of comparison, and play games which involve comparing sets • continue to compare sets by matching, identifying when sets are equal • explore ways of making unequal sets equal. • compare numbers, reasoning about which is more, using both an understanding of the 'howmanyness' of a number, and its position in the number system. • order sets of objects, linking this to their understanding of the ordinal number system.

	arrangement, or when patterns are similar but have a different number • subitise structured and unstructured patterns, including those which show numbers within 10, in relation to 5 and 10 • be encouraged to identify when it is appropriate to count and when groups can be subitised.	• continue to consolidate their understanding of cardinality, working with larger numbers within 10 • become more familiar with the counting pattern beyond 20. • continue to develop verbal counting to 20 and beyond, including counting from different starting numbers • continue to develop confidence and accuracy in both verbal and object counting.				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Place Value	• To identify one more and one less. • To compare quantities (using equal to, more than, less than (fewer), most, least) • To match numbers and quantities. • To locate numbers on a number line. • To read & write numbers from 1-20 in numerals and words. • To identify odd and even numbers. • To understand ordinal numbers. • To compare numbers up to 20 (and beyond). To describe and extend number sequences. • To make ten. • To regroup (carry out a fair swap). • To make ten and count on (in concrete). • To identify ten and count on (in pictorial). • To count out a 2 digit number to 20 and regroup in the 1s.	• To represent 2 digit numbers (concrete) • To count within 100 by making tens first. • To recognise the place value of each digit in a 2 digit number. • To compare numbers from 0 – 100. • To order numbers from 0-100. • To partition and recombine 2 digit numbers into 10s and 1s. • To partition and recombine 3 digit numbers into 100s, 10s and 1s. • To partition numbers in different ways. Identify numbers on a number line. • To use the greater than, less than and equals signs (<,>, =) • To begin to round numbers less than 100 to the nearest 10. • Read and write numbers in numerals and words.	• To represent 3 digit numbers (concrete) • To find 1, 10 or 100 more than a given number (concrete). • To recognise the place value of each digit in a three digit number. • To use part, part whole to partition numbers in different ways. • To compare numbers up to 1000 • To order numbers up to 1000 • Identify, represent and estimate numbers up to 1000 in numerals and words. • To recognise the place value of different measures. • To use dienes and coins to understand place value.	• To represent 4 digit numbers (concrete- place value counters). • To find 1, 10, 100 or 1000 more than a given number (concrete). • To recognise the place value of each digit in a four digit number. • Order numbers beyond 1000. • Compare numbers beyond 1000. • Round any number to the nearest 10, 100, 1000. • To identify and count in negative numbers. • To estimate and round numbers using measuring instruments. • To understand the history of different numeration systems. • To read and understand Roman numerals. • To understand the place value of	• To represent 6 digit numbers (to 1 000 000) (concrete- place value counters). • To recognise the place value of each digit in a six digit number. • To compare & order numbers to at least 1 000 000 • To recognise and describe linear number sequences. • To find the term-to-term rule • To interpret negative numbers • To round numbers to the nearest 10, 100, 1000, 10 000 and 100 000 • To count in steps of powers of 10 up to 1 000 000 • Read Roman numerals • To understand decimals and fractions	• To understand the place value of 7 digit numbers • To identify negative integers. • To calculate intervals across zero. • To find the term-to-term rule • To order and compare numbers up to 10 000 000 • To round any whole number • To extend place value to decimals • To identify decimal numbers on a number line

	• To partition and recombine numbers to 20 into 10s and 1s (teen numbers). • To partition and recombine any 2 digit number into 10s and 1s			decimals and fractions.		
Addition & Subtraction	Addition • To add with number bonds within 10 • To know all number bonds to 10 • To add with number bonds to 20 • To investigate all possible sets of two numbers to make a given number. • To partition numbers into part, part, whole. • To use a number line to count on. • To use inverse (write corresponding subtraction facts to given addition facts- number families). • To add two 1 digit numbers using 'make 10' strategy • To add a 1 digit and a 2 digit number using the 'regrouping into tens and ones' strategy. • To solve one step word problems using 'part-whole' or adding on concept Subtraction • To break numbers into parts • To subtract with number bonds	Addition • To use the counting on strategy (with number line, Dienes or mentally) • To use making ten strategy to add • To use partitioning to add • To add a two digit number and tens • To add a two digit number and ones without regrouping • To add 2 two-digit numbers without regrouping • To regroup and rename • To add three one-digit numbers • To add numbers with regrouping (in ones) • To add numbers with regrouping (in tens.) • Use the inverse to solve missing number problems • To solve one step word problems using 'part, whole' and adding on Subtraction • To break numbers into parts	Addition • To use partitioning to add • To use a number line for addition • To solve missing number problems • To add a three digit number and ones without regrouping • To add a three digit number and tens without regrouping • To add 2 three-digit numbers without regrouping • To add three-digit numbers with regrouping • To add using place value counters • To develop and recognise patterns in addition • To estimate the answer to a calculation • To solve word problems Subtraction • To find the difference using a number line (for near numbers) • To use number bonds to subtract mentally • To subtract without regrouping To	Addition • To add four digit numbers (no regrouping) • To add with regrouping in the 100s • To add with regrouping in the 100s, 10s and1s • To add with regrouping in the 1000s, 100s, 10s and 1s • To identify common misconceptions in column addition • To round off numbers to the nearest 10 / 100. • To estimate to check answers • To add decimals up to 2 decimal places • To solve two step word problems. Subtraction • To subtract up to 4 digit numbers (no regrouping) • To subtract with regrouping in hundreds and thousands • To subtract with regrouping in	Addition • To add four digit numbers (regrouping in the 1000s, 100s, 10s and 1s) • To identify common misconceptions in column addition • To round off numbers to the nearest 10. • To round off numbers to the nearest 100. • To add decimals up to 2 decimal places • To add money using the column method (regrouping) • To add measures using the column method (regrouping) • To find the missing value • To use part, part whole to add money To solve two step word problems using the bar model. Subtraction • To subtract four digit+ numbers (regrouping in the 1000s, 100s, 10s and 1s) • To identify common misconceptions in column subtraction • To round off numbers to the nearest 10.	Addition • To solve any additions with numbers to 2 decimal places. • To carry out calculations involving the four operations. • To work systematically to solve a problem • To solve multi step word problems. • To use estimation to check answers to calculations. • To add negative numbers. • To understand the order of operations using brackets Subtraction • To solve any subtraction with numbers to 2 decimal places. • To carry out calculations involving the four operations. • To work systematically to solve a problem • To use estimation to check answers to calculations. • To subtract negative numbers.

	• To subtract by taking away. • To subtract by counting on. • To subtract small numbers where sets are hidden. (counting on) • To subtract by counting backwards. • To subtract within 20 by regrouping into tens and ones • To use a number line to count back. • To make a family of number sentences • To use inverse (write corresponding subtraction facts to given addition facts-number families). • To solve missing number problems • To solve one step word problems using part whole method	• To use the number bond strategy to subtract • To subtract a one digit number from a two digit number without regrouping • To subtract 2 two-digit numbers without regrouping • To use the counting backwards strategy to subtract • Use the 'take away' strategy to subtract • To subtract a one digit number from a two digit number with regrouping • To subtract 2 two-digit numbers with regrouping • To solve one step word problems using 'part, whole'	subtract with regrouping in tens and ones • To subtract a 3 digit number with regrouping in hundreds and tens • To subtract a 3 digit number with regrouping in hundreds, tens and ones • To count back to find the difference • To estimate the answer to a calculation To use inverse operations to check answers • To subtract 'taking away' one set using the bar model • To subtract 'comparing two sets' using the bar model	hundreds, thousands, tens and ones • To subtract with numbers that have zeros • To identify common misconceptions in column subtraction • To round off numbers to the nearest 10 / 100. • To estimate and use the inverse to check • To subtract decimals up to 2 decimal places • To solve subtraction two step word problems • Use take away and comparing models to solve subtraction word problems.	• To round off numbers to the nearest 100. • To subtract decimals up to 2 decimal places • To subtract money using the column method (regrouping) • To subtract measures using the column method (regrouping) • To find the missing value • To solve two step word problems using the bar model	• To understand the order of operations using brackets. • To round numbers accurately • To solve multi step word problems.
Multiplication & Division	Multiplication • To place objects into equal groups • To double numbers • To double two digit numbers • To place objects into arrays • To pictorially represent multiplication sentences • To understand repeated addition • Can describe an array in two ways • To make multiplication stories	Multiplication • To identify odd and even numbers • To understand multiplication as repeated addition • To use arrays • To know 2, 5, 10 timestables. • To multiply using partitioning • To understand the commutative property of multiplication. • To interpret multiplication sentences	Multiplication • To use number bonds for factors and products • To understand how place value changes when multiplying by 10 • To calculate two digit numbers multiplied by one digit numbers • To carry out short multiplication without regrouping • To carry out short multiplication with regrouping in ones, tens and hundreds	Multiplication • To multiply by ten using place value grids and dienes • To multiply two digit numbers by a one digit number • To multiply three digit numbers by one digit number • To multiply two digit by two digit number • To use the distributive law: 32x3 = (30x3) + (2x3) = 90+6 = 96 • To use associative law to multiply three numbers	Multiplication • To identify common factors of two numbers. • To know prime numbers, prime factors and composite (non-prime) numbers • To solve problems involving multiplication. • To multiply numbers up to four digits by a one digit number • To multiply numbers up to four digits by a two digit number	Multiplication • To multiply multi digit numbers up to 4 digits by a two digit whole number • To carry out operations involving the four operations • To multiply fractions • To multiply decimals • To understand the order of operations using brackets • To relate common factors to equivalent fractions Division

	To move towards the bar model to solve word problems Division • To solve division problems by sharing equally (up to 20 then beyond) • To solve division problems by finding the number of groups (up to 20 then beyond) • To relate grouping to repeated subtraction. • Use arrays to help solve division problems • To know the link between multiplication and division • To solve one step word problems	• To know all corresponding multiplication and division facts • To break a number into factors • To connect the 10 times table with place value • To use the bar model to represent word problems Division • To use number bonds for factor and products (using multiples of 2, 5 and 10) • To identify missing factors • To recognise odd and even numbers • To use concrete apparatus to solve division problems (sharing) • To use concrete apparatus to solve division problems (grouping) • To divide with remainders (in concrete) • To use pictorial representations to solve division problems (sharing) • To use pictorial representations to solve division problems (grouping) • To use the bar model to help solve division problems	• To understand measuring and scaling problems Division • To use number bonds for factor and products (using multiples of 3,4 and 8) • To identify missing factors • To derive related division facts from known multiplication facts • To use the distributive property strategy to divide 'friendly' numbers. • To divide a two digit number by a one digit number (in concrete with and without remainders) • To divide a two digit number by a one digit number using short division (no remainders) • To solve problems where items are shared equally (12 sweets between 4 children) • To solve problems where items are shared using knowledge of fractions (4 cakes shared between 8 children) • To know whether to round up or down depending on context.	• To solve problems using scaling • To derive multiplication and division facts from three digit numbers • To solve two step word problems. • To recognise factors of a number • To multiply decimals Division • To use number bonds for factor and products (To solve missing number sentences) • To make the link between sharing, arrays and short division. • To use known facts to derive facts involving 3 digit numbers (If I know 2x3 = 6 I can work out that 600÷3=200) • To use the distributive property strategy to divide 'friendly' numbers. • To divide a three digit number using short division (Regrouping in tens and ones) • To divide a three digit number using short division (Regrouping in tens, ones and hundreds) • To solve two step word problems	• To recognise and use squared and cubed numbers • To understand the law of distributivity • To multiply whole numbers& decimals by 10, 100, 1000 Division • To use number bonds for factor and products and to identify missing factors (using fractions and decimals). • Divide whole numbers by 10,100 and 1000 • Divide decimals by 10, 100 and 1000 • To divide by powers of 10 (in scale drawings). • To divide by powers of 1000 (in converting between units such as km and m) • To solve division problems with decimals using place value counters. • Divide numbers up to 4 digits by a one digit number (with remainders) • To use the distributive property strategy to divide 'friendly' numbers. • To interpret remainders appropriately for the context (rounding up or down) • To interpret non-integer answers to	• To use number bonds for factor and products • To identify missing factors • Divide numbers up to 4 digits by 1 digit then 2 digit whole number using short division. • Interpret remainders as whole number remainders, fractions or rounding. • To use the distributive property strategy to divide 'friendly' numbers. • Divide numbers up to 4 digits by 1 digit whole number using long division. • Divide numbers up to 4 digits by 2 digit whole number using long division. • To interpret remainders appropriately for the context • To understand the order of operations • To solve word problems

		• To use arrays to help solve division problems • To create number families using multiplication and division facts. (4x5=20 and 20÷5=4) • To know whether to round up or down depending on context.			division by expressing results in different ways • To solve multi step word problems	
Fractions, Decimals & Percentages	• To recognise half an object (as one of two equal parts) • To recognise a quarter of an object (as one of two equal parts) • To recognise half a shape (as one of two equal parts) • To recognise a quarter of a shape (as one of two equal parts) • To identify half a quantity (to share equally between 2) • To identify a quarter of a quantity (to share equally between 4) • To know that a quarter is the same as half and half again • To place fractions on a number line • To identify halves (use Cuisenaire rods)	• To divide shapes into equal parts. • To know that and is equal to a whole. • To identify fractions of a length. (using halves, thirds and quarters) • To identify fractions of a shape. (using halves, thirds and quarters) • To identify fractions of a set of objects by sharing equally. (between two, three and four) • To identify fractions of a quantity. (using halves, thirds and quarters) • To identify all the different ways to make fractions • To recognize fractions of a length, shape and object. • To recognise equivalent fractions. • To place fractions on a number line • To count in fractions • To use the bar model to show fraction	• To identify unit fractions of objects, shapes and length. (a unit fraction has 1 as the numerator) • To identify non-unit fractions of objects, shapes and length. (a non-unit fraction has >1 as the numerator) • To calculate fractions of a quantity • To recognise equivalent fractions • To recognise that tenths arise from dividing an object into ten equal parts • To compare fractions (fractions with the same denominator) • To order fractions (fractions with the same denominator) • To compare fractions with different denominators • To recognise equivalent fractions • To add like fractions (fractions with the same denominator) • To subtract like fractions	• To identify equivalent fractions • Show equivalent fractions pictorially (and calculate equivalent fractions) • To compare fractions • To use factors and multiples to recognise equivalent fractions • To simplify fractions • Add and subtract like fractions (fractions with the same denominator). • To calculate the fraction of numbers and quantities • Recognise and write decimal equivalents of any number of tenths of hundredths. • Recognise and write decimal equivalents to , ¼, ½, ¾. • Compare numbers with the same number of decimal places (up to 2 decimal places) • Round decimals with one decimal place to the nearest whole number. • To connect fractions, decimals and	• To identify equivalent fractions (including tenths and hundredths) • To compare and order fractions (whose denominators are multiples of the same number) • To calculate fractions of numbers and quantities. • Read and write decimal numbers as fractions. • To convert mixed numbers to improper fractions (and back) • To add and subtract fractions with the same denominator • To add and subtract fractions with denominators that are multiples of the same number. • To add and subtract decimals • To multiply fraction and mixed numbers by a whole number. (use diagrams to support) • To convert fractions to percentage	• To compare and order fractions (including fractions >1) • To use common factors to simplify fractions • To use common multiples to express fractions in the same denomination • To add and subtract fractions with denominators that are multiples of the same number • To add and subtract fractions with different denominators and mixed numbers (using equivalent fractions) • To multiply simple pairs of proper fractions (writing the answer in its simplest form) • To divide proper fractions by whole numbers. • To calculate decimal fraction equivalents (by dividing using a simple fraction) • To multiply one digit numbers with up to

			• To solve word problems involving fraction	measures (using a number line)		two decimal places by whole numbers. • To multiply up to 2 digit decimals by whole numbers. • To interpret remainders as whole number remainders, fractions or by rounding, as appropriate for the context
Geometry	Shape • Recognise and name common 2-D shapes (rectangles (including squares, circles and triangles) • Recognise and name 3-D shapes. • To recognise shapes in different orientations and sizes. • To make models, patterns and pictures using construction kits and everyday material. • To identify shapes in the environment. • To identify and make patterns. Position & Direction • To describe position, direction and movement including back forward. • To identify left and right. • To use prepositional language. • To give directions • To make turns in both directions.	Shape • To identify and describe the properties of 2-D shapes. • To identify the line symmetry in a 2-D shape. • To identify and describe properties of a 3-D shape (edges, vertices and faces) • To identify 2-D shapes on the surface of 3-D shapes. • To compare and sort common 2-D and 3-D shapes and everyday objects. Position & Direction • To order and arrange objects in patterns and sequences. • To describe the position of objects. • To give directions. • To describe and control movement. • To describe movement in terms of right angles for turns. • To programme robots to turn.	Shape • To draw and describe 2-D shapes (reflective symmetry, regular, irregular) • To make 3-D shapes using modelling materials. • To recognise 3-D shapes in different orientations. • To recognise angles as a property of shape. • To identify angles in the environment. • To recognise angles as a description of a turn. (half turn, three quarters turn, 360') • To identify right angles, linking to turns and identifying >< = right angles. (acute, obtuse) • To sort symmetrical and non-symmetrical polygons and polyhedra. • To connect decimals and rounding to drawing and measuring straight lines.	Shape • To compare and classify geometric shapes based on their properties and sizes. • To classify different triangles. • To classify different quadrilaterals. • To use a tree diagram to classify shapes • To identify acute and obtuse angles. • To compare and order angles up to two right angles, by size. • To compare length and angles to decide if a polygon is regular or irregular. • To identify lines of symmetry in 2-D shapes presented in different orientations. • To complete a simple symmetric figure. Position & Direction • To recognise that two right angles make a half turn, three make three quarters and four complete.	Shape • To identify 3-D shapes from 2-D representations (including cubes and other cuboids). • To estimate and compare angles. (obtuse, acute, reflect, right angle) • To draw given angles and measure them in degrees. (using a protractor) • To identify angles at a point and one whole turn. • To identify angles at a point on a straight line. • To identify missing lengths and angles. (using angle sum facts) • To sort regular and irregular polygons. • To draw lines to the nearest mm. • To label parallel lines and right angles. • To identify and use diagonal and parallel lines. Position & Direction	Shape • To draw 2-D shapes given dimensions and angles. • To recognise, describe and build simple 3D shapes. • To make nets. • To visualise a 3-D shape from it's net. • To visualise where patterns drawn on a 3-D shape will occur on its net. • To compare and classify geometric shapes. • To illustrate and name parts of a circle. • To know how to find the diameter of a circle. • To identify angles and find missing angles. • To express relationships algebraically. Position & Direction • To describe positions on all four quadrants • To draw and translate simple shapes on the coordinate plane

	• To link turns with the hands on a clock		• To identify horizontal and vertical lines. • To identify pairs of perpendicular and parallel lines.	• To describe position on a 2-D grid as co-ordinates.(2,5) • Describe movements between positions as translations (left, right, up, down) • To plot specified points. • To draw a polygon. • To draw a pair of axes. • To use coordinate plotting ICT tools.	• To reflect the position of a shape in all four quadrants (extension) • To translate the position of a shape • To translate the position of a shape in all four quadrants (extension) • To use a 2-D grid and coordinates in the first quadrant • To use a 2-D grid and coordinates in all four quadrants. (extension).	• To reflect simple shapes in the axes. • To draw and label all four quadrants with equal scaling. • To use the properties of shapes to predict missing coordinates • To express translations algebraically.
Measurement	• To compare and order length • To measure using a start line • To measure in non standard units • To compare and order mass • To weigh mass in non standard units • To compare and order capacity and volume • To sequence events in chronological order. • To tell the time to the hour • To tell the time to the half hour • To recognise and know the value of different coins and notes • To exchange money • To solve problems involving money (making amounts in different ways)	• To measure and compare lengths and heights in metres (> < =) . • To measure and compare lengths and heights in centimetres. • To solve length problems using the four operations . • To measure and compare masses in kilograms (> < =) . • To measure and compare masses in grams (> < =) . • To solve mass problems using the four operations. • To measure and compare temperature (> < =). • To measure and compare volume (> < =) . • To recognise and use coins and notes and compare amounts.	• To measure and compare lengths in m, cm and mm. • To use multiplication and division to scale by integers. • To measure and compare mass in Kg and g. • To measure and compare volume in l/ml. • To solve measurement problems using both addition and subtraction. • To convert between different units of measure. • To measure and calculate perimeter of 2D shapes. • To calculate change given in both £ and p. • Tell and write the time from an analogue clock (standard clock and with Roman numerals).	• To convert units of measure. • To measure and calculate the perimeter of rectilinear shapes. • To find the area of rectilinear shapes (by counting squares). • To estimate, compare and calculate measures. • To calculate money in pounds and pence using four operations. • To convert time between analogue and digital clocks (12 hour and 24 hour). • To solve problems involving converting time. • To calculate time durations that pass through the hour.	• To convert between different units of metric measure. • To use multiplication and division to inter scale and calculate changing rates. • To use approximate equivalences between metric and imperial units. • To measure and calculate the perimeter of composite rectilinear shapes. • To solve missing measure questions when presented algebraically. • To calculate and compare the area of rectangles. (cm^2 and m^2) • To estimate the area of irregular shape. • To estimate and measure capacity. • To estimate volume.	• To convert measures using decimal notation (to three decimal places). • To convert between miles and kilometres. • To connect conversion to a graphical representation. • To add and subtract positive and negative integers using a numberline. • To prove that shapes with the same area can have different perimeters. • To understand when to use a formula to calculate area/volume. • To calculate the area of parallelograms • To calculate the area of triangles. • To calculate, estimate and compare the volume of cubes and cuboids

		• To select different combinations of coins to make a particular value. • To calculate giving change up to and including £1.00. • To exchange pence for pounds. • To compare and sequence intervals of time. • To tell and write the time to quarter past/to and five minutes.	• To match digital and analogue clocks. • To read and record time to the nearest minute. • To compare time in seconds, minutes and hours. • To convert hours and minutes. • To calculate and compare duration of events.		• To solve problems involving converting units of time. • To use all four operations to solve problems involving measure.	• To solve problems involving money using the four operations. • To solve time duration problems using the four operations.
Statistics		• To replace accordingly with pictograms/tally charts/block diagrams/simple tableso count the number of objects in each category and sort the categories by quantity. • To compare categorical data • To make pictograms and graphs where one symbol represents more than one unit. • To read and interpret a simple key • To ask and answer questions about categorical data. • To read the scale on a graph. • To sort objects using more than one criteria (Carroll diagrams) • To sort objects using more than one criteria (Venn diagrams)	• To interpret and present data using bar charts • To interpret and present data using pictograms • To interpret and present data using tables • To recognise importance of titles and labels when sorting data • To solve one step questions using statistical information. • To solve two step questions using statistical information • To understand and use simple scales • To classify shapes, numbers and objects into a Venn diagram. • To classify shapes, numbers and objects into a Carroll diagram	• To interpret and present data in a bar chart • To interpret and present data in a time graph • To solve comparison problems using information presented (in a range of tables/graphs). • To solve sum problems using the information presented (in a range of tables/graphs). • To solve finding the difference problems using the information presented (in a range of tables/graphs). • To understand and use a range of scales. • To understand the recording of change over time. • To record change over time in a range of graphs.	• To solve comparison problems using information in a line graph. • To solve sum problems using information in a line graph • To solve difference problems using information in a line graph. • To complete, read and interpret information in tables (including time tables) • To make links with coordinates • To choose the appropriate representations of data.	• To interpret line graphs. • To construct line graphs • To solve problems using line graphs. • To interpret pie charts • To construct pie charts (using a computer programme). • To solve problems using pie charts • To connect angles and pie charts • To connect fractions and percentages with pie charts • To calculate and interpret the mean as the average. • To draw graphs relating to two variables. • To connect conversion from km to miles in measurement to its graphical representation.

				• To record data into Venn and Carroll diagrams.		• To choose the appropriate representations of data.
Algebra						• To use simple formula to generate, express and describe: -Linear number sequences -Mathematical formula -Missing number, lengths, coordinates and angles problems -equivalent expressions (a+b = b + a) • To find pairs of numbers that satisfy and equation with two unknowns • To find all possibilities of combinations of two variables.
Ratio & Proportion						• To use ratio to compare two things • To find equivalent ratios • To compare three quantities using ratios • To follow simple recipes involving basic proportions • To read a simple scale on a map e.g. 1cm = 100cm , 250:1 means 1cm = 2.5m. • To solve problems involving missing values. (using integer multiplication and division facts). • To solve problems involving percentages • To use percentages for comparison

						• To use the scale factor to solve problems involving shapes • To use knowledge of fractions and multiples to solve problems involving unequal sharing

Times Tables Progression Map

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Count forwards and backwards in 2s, linking with even numbers and doubling. Count forwards and backwards in 10.		Count forwards and backwards in 5s, linking with counting in 10s. Develop fluency for counting forwards and backwards in 2s and 10s.		Count forwards and backwards in 2s, 5s and 10s with growing fluency.	Count forwards and backwards in 2s, 5s and 10s fluently.
Year 2	Consolidate counting in steps of 2, 5 and 10 in order from. 0 up to 12x.	Count in steps of 2 and 5 from 0 up to 12x fluently. Recall multiplication facts for the 10 times table, including missing number questions, and division facts with growing fluency.	Recall multiplication facts for the 10 times table, including missing number questions, and division facts fluently. Recall multiplication facts for the 2 times table, including missing number questions, and division facts with growing fluency.	Recall multiplication facts for the 2 times table, including missing number questions, and division facts with growing fluency. Recall multiplication facts for the 5 times table, including missing number questions, and division facts with growing fluency.	Recall multiplication facts for the 2 times table, including missing number questions, and division facts fluently. Recall multiplication facts for the 5 times table, including missing number questions, and division facts with growing fluency.	Recall multiplication facts for the 5 times table, including missing number questions, and division facts fluently. Mixed practice multiplication and division facts for 2, 5 and 10 times tables.
Year 3	Recall multiples of 2, 5, and 10 in any order, including missing numbers and related division facts fluently. Count in multiples of 4 to 12 x 4 in order from 0 fluently, using multiples of 2 to support, and begin to recall multiplication facts.	Recall multiplication and division facts for the 4 times table, including missing number questions. Count in multiples of 8 to 12 x 8 in order from 0 fluently, using multiples of 4 to support, and begin to recall multiplication facts.	Recall multiplication and division facts for the 8 times table, including missing number questions. Count in multiples of 3 to 12 x in order from 0 fluently and begin to recall multiplication facts.	Recall multiplication and division facts for the 3 times table, including missing number questions.	Mixed practice multiplication and division facts for 2, 3, 4, 5, 8 and 10 times tables.	Reasoning and problem solving for all multiplication and division facts for 2, 3, 4, 5, 8 and 10 times tables.
Year 4	Recall multiples of 2, 3, 4, 5, 8 and 10 in any order, including missing numbers and related division facts fluently. Fluently count in 6's in any order up to 12 x 6, using multiples of 3 to support, and recall multiplication facts.	Recall multiplication and division facts for the 6 times table, including missing number questions. Fluently count in 9's in any order up to 12 x 9, using multiples of 3 and 6 to support, and recall multiplication facts	Recall multiplication and division facts for the 9 times table, including missing number questions. (Using 10x and adjusting by 1) Fluently count in 11's in any order up to 12 x 11, and recall multiplication facts	Recall multiplication and division facts for the 11 times table, including missing number questions. (Using 10x and adjusting by 1) Fluently count in 7's in any order up to 12 x 7, and recall multiplication facts.	Recall multiplication and division facts for the 7 times table, including missing number questions. Fluently count in 12s, in any order up to 12 x 12, and recall multiplication and division facts and missing number questions. (Using 10x nd adjusting by adding 2 more groups)	Mixed practice multiplication and division facts for up to 12 x 12
Year 5	Recall multiplication and division facts for the 12 times tables, including missing numbers and related division facts fluently.					

	Recall all multiplication and division facts up to 12 x12 in any order, including missing numbers and related division facts with growing fluency.	

Mental Calculations Progression Map

Reception		
Foundations	• To know that the numeral represents a quantity • To be able to subitise up to 10 where patterns are arranged in different ways • To read numbers to 20 • To order numbers to 20 • To count accurately to 20 with 1:1 correspondence	
Mental Strategies		
Counting forwards and back in steps.	• Count on or back in ones from any number to 20 • To identify one more or one less than a number within 20	• 4 + 1 • 15 - 1
Reordering calculations.	• To reorder numbers in calculations to make them easier to calculate	• 2 + 7 = 7 + 2
Making and breaking numbers	• To partition numbers to 10	• 5 + ___ = 10
Partitioning by bridging a multiple of 10,	• To know number bonds to 5	• What do I need to add to 2 to make 5? • 3 + __ = 5 • 4 + 1 = __
Doubles.	• To identify doubles to 5 + 5	• 4 + 4 • 3 + __ = 6
Year 1		
Rapid Recall	• Addition and subtraction facts to 10 • Addition and subtraction facts within 10 • Doubles for all numbers to ten and the corresponding halves • One more / less than any number to 100 • 10 more / less than any multiple of ten	
Mental Strategies		
Counting forwards and back in steps.	• Count on or back in ones from any number • Count on or back in twos, fives and tens.	• 6 + 1 • 11 - 1 • 18 - 4 (18-2-2) • 15 - 5 • 20 - 10
Reordering calculations	• Reorder numbers in a calculation considering which number is easier to count on from / can we reorder this question? ie 7 - 2 can't be reordering 2 - 7 . • Looking for bonds, doubles, known facts	• 2 + 7 = 7 + 2 • 5 + 13 = 13 + 5 • 7 + 4 + 3 = 7 + 3 + 4
Partitioning and counting on/back	• Partition into tens and ones to add teen numbers to single digits	• 13 + 4 = 10 + 3 + 4

Partitioning by bridging a multiple of 10	• Begin to use knowledge of partitioning to bridge through ten when adding two single digit numbers	• 7 + 4 = (7 + 3) + 1 • 5 + 6 = (5 + 5) + 1
Partitioning by compensating	• Add 9 to a single digit number by adding 10 and subtracting 1 • Subtract 9 from a single digit number by subtracting ten and adding 1	• 6 + 9 = 6 + 10 - 1 • 15 - 9 = 15 - 10 + 1
Partitioning using near doubles	• To identify near doubles using doubles already known	• 4 + 5 = 4 + 4 + 1 • 6 + 6 = 6 + 6 - 1
Partitioning by bridging through 60 (time intervals)	• To know the number of days in a week, months in a year • To know one hour is when the minute hand does one complete journey around the clock	• What time will be one hour after 9 o'clock?
Year 2		
Rapid Recall	• Addition and subtraction facts to and within 10 • Addition and subtraction facts to 20 • All pairs of multiples of 10 with a total of 100 • Multiplication facts for the 2, 5 and 10 times tables and corresponding division facts • Doubles of all numbers to ten and corresponding halves	
Mental Strategies		
Counting forwards and back in steps.	• Count on or back in tens and ones from any number • Count on or back in twos, fives and tens.	• 43 + 10 • 24 - 12 (24-10-1-1) • 25 + 13 • 28 - 6 (28-2-2-2) • 35 - 15 (35-5-5-5)
Reordering calculations	• Reorder numbers in a calculation considering which number is easier to count on from • Looking for bonds, doubles, known facts	• 3 + 73 = 73 + 3 • 8 + 7 + 2 = 8 + 2 + 7
Partitioning and counting on/back	• Partition additions into tens and ones and then recombine •	• 23 + 14 = 20 + 10 + 3 + 4 • 78 - 40 = 70 - 40 - 8
Partitioning by bridging a multiple of 10	• To use known number facts to partition and bridge through 10 and 20	• 6 + 7 = 6 + 4 + 3 • 23 - 9 = 23 - 3 - 6 • 15 + 7 - 15 + 5 + 2
Partitioning by compensating	• To add and subtract 9, 19, 11 or 21 by rounding and compensating	• 38 + 9 = 38 + 10 - 1 • 52 + 21 = 52 + 20 + 1 • 63 - 19 = 63 - 20 - 1
Partitioning using near doubles	• Identify near doubles	• 39 + 40 = 40 + 40 - 1 • 13 + 14 = 13 + 13 + 1
Partitioning by bridging through 60 (time intervals)	• To know the number of days in a week, months in a year, hours in a day and minutes in an hour	• What time will be one hour after 9 o'clock? • It is (show 9.30 on a clock), how many minutes until 10 o'clock?
Year 3		
Rapid Recall	• Addition and subtraction facts for each number to 20 • Sums and differences between two multiples of 10	

	• Add and subtract 10 and 100 to a given number • Number pairs to 100 e.g., 45 + 55 • Multiplication and corresponding division facts for the 2, 5, 10, 4, 8 and 3 times tables • To identify whether numbers are multiples of 2, 5, 10 and 50 • Quickly derive doubles up to 20 + 20	
Mental Strategies		
Counting forwards and back in steps.	• Count in multiples of 50 and 100 • Count in multiples of 2, 3, 4, 5, 8 and 10 • Count on or back in tens from any 2 or 3 digit number • Count on or back in 100s from any 3 digit number.	• 124 + 40, 456 - 30 • 350 + 400, 1500- 600, 400 + 267
Reordering calculations	• Putting the largest number first • Using Number bonds • Using doubles or near doubles • Using friendly numbers	• 23 + 52= 52 + 23 • 16 + 7 + 4= 16 + 4 +7 • 15 + 22 + 16 = • 15 + 16 = 31 • 31 + 22 = 53 • 12 - 7 - 2 = 12 - 2 - 7
Partitioning and counting on/back	• Partitioning and recombining •	• 23+45 =20 + 40 + 3 +5 • 68 - 32 = 68 - 30 - 2
Partitioning by bridging a multiple of 10	• Making and breaking one of the addends to bridge a multiple of 10	• 80 + 34 = 80 + 20 + 14 • 125 - 37 = 125 - 25-22 • 196 + 27= 196 + 4 + 23
Partitioning by compensating	• Add and subtract a number by adding or subtracting the multiple of 10 and adjusting by 1.	• 53 + 11, 53 + 41 • 53 + 9, 53 + 39 • 84 - 11, 84 - 41 • 84 - 9, 84 - 49
Partitioning using near doubles	• Identifying the double and adjusting.	• 18+16= double 16 + 2 • 36+35=double 35+ 1 • 60+70= double 60 +10
Partitioning by bridging through 60 (time intervals)	• Using number lines as jottings or mentally to add or subtract time or find time durations.	• 40 minutes after 3.30pm • 50 minutes before 5.00pm • It is 9.45am. How many minutes until 10.15am?
Year 4		
Rapid Recall	• Rapid recall of all addition and subtraction facts to 20 • Multiplication and corresponding division facts for all times-tables to 12 x 12 • To multiply and divide by 10, 100 and 1000. • To add or subtract 10, 100 or 1000 to any number with up to 4 digits. • Derive quickly number pairs that make 100 and pairs of multiples of 50 that make 1000. • Know all doubles up to 50 + 50, and multiples of 10 (e.g. 230 + 230) and multiples of 100 (e.g. 1800 + 1800)	
Mental Strategies		
Counting forwards and back in steps.	• Count in multiples of 25 and 1000 • Count in multiples of 2, 3, 4, 5, 6, 7, 8, 9 and 10 • Count on or back in tens from any 3 digit number, crossing boundaries.	• 184 + 40, 416 - 30 • 850 + 400, 1500- 800, 400 + 1267 • 2656 + 7000 • 1267 - 500

	• Count on or back in 100s from any 3 digit number, crossing boundaries. • Count on or back in 1000s from any number, crossing boundaries. • Count backwards through zero to negative numbers.	• 4- 7 • 23 - 30
Reordering calculations (when it is presented in written form)	• Using Number bonds • Using doubles or near doubles. • Using friendly numbers • Reordering calculations where there are different operations	• 65+81+35 = 65+35+81 • 1600 + 1800 +1600 = 1600 + 1600 + 1800 • 28 + 75 = 75 + 25 + 3 • 17 + 9 - 7 = 17 - 7 + 9
Partitioning and counting on/back	• Partitioning and recombining in 3 digit numbers • Partitioning one of the numbers in an addition or subtraction.	• 123+452 = 100+400+20+50+3+2 • 623 + 263 = 623 + 200 + 60 + 3 • 681 - 57 = 681 - 50 - 7
Partitioning by bridging a multiple of 10	• Making and breaking one of the addends/ subtrahends to bridge a multiple of 10 • Making and breaking one of the addends/ subtrahends to bridge a multiple of 100 • Finding out what to add to a 3 digit number to make the next multiple of 100. • Adding numbers with 1 dp to make next whole no.	• 87 + 45 = 87 + 3 + 42 • 53 - 27 = 53 - 3 - 24 • 87 + 25 + 87+13+ 12 • 114 - 25 = 114-14-11 • 246 + ____ = 300 • 3.4 + __ = 4
Partitioning by compensating	• Add and subtract a number by adding /subtracting the multiple of 10 and adjusting .	• 53 + 39= 53 + 40 - 1 • 84 - 49= 84 - 50 + 1 • 135 + 99= 135 + 100 - 1 • 247 - 99= 247 - 100 + 1
Partitioning using near doubles	• Identifying the double and adjusting.	• 35 + 38= 35 + 35 + 3 • 160 + 170= • 150 + 150 + 30 • 400+400-20-20
Partitioning by bridging through 60 (time intervals)	• Using number lines as jottings or mentally to add or subtract time or find time durations.	• It is 3.25pm. How many minutes until 4.10pm?
Year 5		
Rapid Recall	• Multiplication and corresponding division facts for all times tables up to 12 x 12 • To multiply and divide whole numbers and decimals by 10, 100 and 1000. • To know 1000, 10,000 and 100,000 more/less than any 6-digit number	
Mental Strategies		
Counting forwards and back in steps.	• To count in steps of powers of 10 up to 1,000,000. • To count forwards and backwards with positive and negative whole integers (including through zero) • To count on/back in quarters • To add a 3 digit multiple of 10 to a 3-digit number without crossing the hundreds barrier • To subtract multiples of 10 and 100	• 1 ½ + ¾ • 230 + 364 = • 620 - 380, 6200 - 3800
Reordering calculations (when it is presented in written form)	• Using Number bonds • Using doubles or near doubles. • Using friendly numbers • Reordering calculations where there are different operations	• 65+81+35 = 65+35+81 • 850 + 620 + 150 = • 1600 + 1800 +1600 = 1600 + 1600 + 1800 • 1.7 + 2.8 + 0.3 = • 1.7 + 0.3 + 2.8

		• 28 + 75 = 75 + 25 + 3 • 58 + 47 - 38 = 58 - 38 + 47
Partitioning and counting on/back	• Partitioning and recombining in 3 digit numbers • Partitioning one of the numbers in an addition or subtraction. • Adding 3 two digit numbers • Partitioning numbers with 1 decimal point.	• 123+452 = 100+400+20+50+3+2 • 623 + 263 = 623 + 200 + 60 + 3 • 681 - 57 = 681 - 50 - 7 • 43 + 28 + 51 = • 40 + 20 + 50 + 3 + 8 +1 • 5.6 + 3.7= 5.6 + 3 + 0.7 • 4.7- 3.5 = 4.7 - 3 - 0.5
Partitioning by bridging a multiple of 10	• Making and breaking one of the addends/ subtrahends to bridge 1 • Adding numbers with 2 decimal point to make the next whole number • Finding the difference between two decimal numbers by bridging a tenth. • Finding the difference between two 4-digit numbers by bridging a multiple of 1000.	• 3.8 + 2.6 = 3.8 + 0.2 + 2.4 • 23.27 + ____ = 24.00 • 0.7- 0.26 = • 0.26 + 0.04= 0.3 • 0.3 + 0.4 = 0.7 • 3009 - 2850 =
Partitioning by compensating	• Add and subtract a number by adding /subtracting the multiple of 10 or 100 and adjusting • Partition by compensating with money and measure. • Bridging whole numbers when adding and subtracting mixed fractions	• 84 - 48= 84 - 50 +2 • 135 + 99= 135 + 100 - 1 • 405-399=405- 400 + 1 • £3.45 + 99p • 2 ½ + 1 ¾ = 2 ½ + 2 - ¼
Partitioning using near doubles	• Identify doubles in decimal numbers	• 1.5 + 1.6 = 1.5 + 1.5 + 0.1 • 1.6 + 1.6 -0.1
Partitioning by bridging through 60 (time intervals)	• Using number lines as jottings or mentally to add or subtract time or find time durations.	• The time is 11.30. How many minutes until 14.20?
Year 6		
Rapid Recall	• Multiplication and division facts including scaling up and scaling down e.g. 0.8 x 7, 4.8 ÷ 6, 600 x 7, 810 ÷ 9 • Squares of numbers to 12 x 12 and the corresponding squares of multiples of 10 • To multiply and divide whole numbers and decimals by 10, 100 and 1000 • To know 1000, 10,000 and 100,000 more/less than any 6 digit number	
Mental Strategies		
Counting forwards and back in steps.	• Count in multiples of any number. • To be able to count forwards and backwards in 11s, 15s, 19s, 21s and 25s (dipping into zero) • To count in steps of 0.1, 0.5, 0.25 to 10 and back. • To count in steps of powers of 10 up to 1,0000,000 • Count backwards through zero to negative numbers.	• 1.7+ 0.5
Reordering calculations	• Using Number bonds to multiples of 10 or 1 • Reordering calculations where there are different operations	• 34+27+46 =34 +46+27 • 4.6 + 3.8 + 2.4= • 4.6 + 2.4 + 3.8 • 8.7 + 5.6 - 6.7= • 8.7 - 6.7 + 5.
Partitioning and counting on/back	• Partitioning one of the numbers in an addition or subtraction. • Adding 3 two digit numbers	• 623 + 263 = 623 + 200 + 60 + 3 • 681 - 57 = 681 - 50 - 7

	• Partitioning numbers with 1 dp.	• 43 + 28 + 51 = 40 + 20 + 50 + 3 + 8 +1 • 5.6 + 3.7= 5.6 + 3 + 0.7 • 4.7- 3.5 = 4.7 - 3 - 0.5
Partitioning by bridging a multiple of 10	• Making and breaking one of the addends to bridge 1 • Finding the difference between two decimal numbers by bridging a tenth. • Finding the difference between two 4 digit numbers by bridging a multiple of 1000 • Making and breaking one of the addends/ subtrahends to bridge a multiple of 100 • Bridging in the context of money.	• 3.8 + 2.6 = 3.8+0.2 +2.4 • 0.8 +0.35=0.8 +0.2+0.15 • 0.7- 0.26 = 0.26 + 0.04= 0.3 • 0.3 + 0.4 = 0.7 • 3.6- 2.7= 2.7 + 0.3 = 3 • 3 + 0.6 = 3.6 • 3009 - 2850 = • 596 + 134=596+4+ 130 • 584 -176=584-184 + 8 • £23.50-£17.75
Partitioning by compensating	• Add and subtract a number by adding /subtracting the multiple of 1 and adjusting .	• 5.7 + 3.9 = 5.7 +4.0-0.1 • 6.7 - 4.8 = 6.7- 5 + 0.2
Partitioning using near doubles	• Identify doubles in decimal numbers • Identify near doubles	• 3.75 + 3.65= 3.65 + 3.65 + 0.1 • 3.75 + 3.75 - 0.1 • 5.3 + 5.5 = 5.3 + 5.3 + 0.2 = 5.5 + 5.5 - 0.2 • 421+ 387 = double 400 + 21 - 13
Partitioning by bridging through 60 (time intervals)	• Using number lines as jottings or mentally to add or subtract time or find time durations.	• The time is 11.30. How many minutes until 14.20?