Maths planning document

Teagues Bridge Primary school

2023 – Year 5

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Reviewed on:	March 2023
Next review:	March 2024
Staff Responsibility	Mr M Hale
Governor responsibility	Drew White

This document supported by the CLIC maths program providing teaching and consolidation of mental strategies for mathematics and the white rose small steps for teaching sequences. Weeks are a guideline and should be adapted for the needs of the children. Time for consolidation is designed for recapping of previous units to ensure learning in committed to the long-term memory. This can also be used to teach areas of misconceptions.

Mathematics Intent

At Teagues Bridge, our intention is **ambitious.** We aim to create strong mathematicians who have the necessary skills and understanding to tackle mathematical challenges in varying contexts, including the ability to reason and apply their knowledge to solving problems. This should mean that children are able to apply their knowledge to everyday life and can **aspire** to achieve anything that they want. We want our pupils to have strong mental manipulation and to use written strategies when appropriate.

Our philosophy for mathematics is replacing an idea that maths is lots of rules and numbers with a study of patterns and connected ideas. In early years they will build a foundation of number understanding and representation through mainly concrete and pictorial representations. The approach will be supported by in depth questioning, throughout the school to develop mastery.
Use of CPA is encouraged to ensure the curriculum is accessible for all children and that they all have the **opportunity** and are able to demonstrate their understanding in a variety of ways. This will enable them to have a good understanding of maths and not just the ability to follow a procedure. We want to **empower** them to want to ask questions and want to find the answers.

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 nonroutine 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.

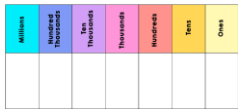
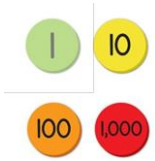
The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly 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.

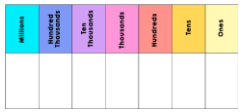
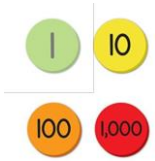
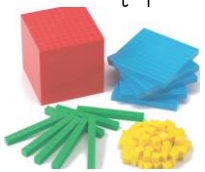
Our lessons are structured to enable all children to achieve and have an **opportunity** to make progress with their learning. Each lesson begins with a **CLIC maths** activity, where they have chance to develop their mental strategies, secure number facts and number manipulation. They then **develop** their mathematical fluency with the teacher modelling and explaining before they have a go themselves. Children then have a **reasoning/ problem solving** activity which is a variation of the previous work to demonstrate they have mastered the objective. Children who are ready can then **challenge** themselves with a task that requires applying the learning to a greater depth. We have our own programme of study which is supported with schemes like White Rose to support.

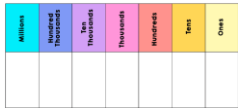
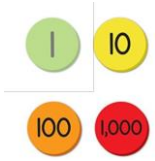
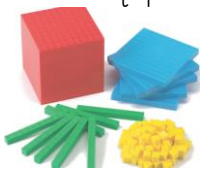
Year 5 – Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Number and place value Counting, reading, writing and partitioning		Addition and subtraction Whole numbers 4++ digits and inverse		Multiplication and division – multiples, factors, primes, square and cubed Multiplying and dividing by 10,100 and 1000			Fractions :converting, adding and subtracting			Multiplication : short and long multiplication		Measurement: Perimeter and area	
Spring	Number and place value : comparing/ordering and rounding		Addition and subtraction Multi-step problems/ missing numbers		Fractions: adding and subtracting mixed numbers		Number : negative numbers	Multiplication – long multiplication (revisit) and short division		Fractions: multiplying and fractions of amounts		Decimals : tenths, hundredths and thousandths		
Summer	4 methods of calculation (including inverse)		Geometry : angles		Decimals : addition and subtraction Multiplying and dividing by 10,100 and 1000			Measurement : Converting units		Geometry : Position and direction		Statistics		Measure ment : Volume

Year 5: Autumn term

National curriculum objectives	Prior knowledge from year 4	Learning outcomes (including WR steps)	Mathematical aspect	Vocabulary	Manipulatives	Problem solving resources
Lessons cover both objectives together • Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • To read, write, numbers at least to 1,000,000 and determine the value of each digit.	Knows the properties of place value for four-digit numbers.	Maths resources for teachers | White Rose Maths **Steps 2 – 9** LO: I know the place value of numbers upto 10,000 LO I know the place value of numbers upto 100,000 Lo: I know the place value of numbers to 1,000,000 Lo I know to read and write numbers to 1,000,000 Lo I know powers of 10. Lo I know finding more or less of 10/100/1,000/10,000 and 100,000	**Place Value**	ones (1s) tens (10s) hundreds (100s) thousands (1,000s) ten thousands (10,000s) place value partition estimate round compare order equivalent greater than (>) less than (<)	Place value charts  Place value counters  Base ten equipment 	Counting forwards and backward **Space Distances** *

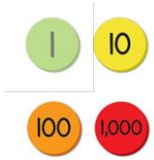
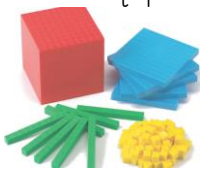
		Lo I know partitioning numbers to 1,000,000 Lo I know locating numbers to 1,000,000 on a number line.				
• Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals		Step 1 Lo I know to read roman numerals to 1,000	**Place value: Roman Numerals**	roman numerals x -10 v =5 I = 1 C =100 D =500 M = 1000		Roman numerals **Roman Numerals** *
• Add and subtract numbers mentally with increasingly large numbers	Knows efficient methods for addition and subtraction up to and including four-digit numbers.	Maths resources for teachers | White Rose Maths Step 1 Lo I know mental strategies to add and subtract	Addition and Subtraction: mental calculation methods	add subtract ones (Is) tens (10s) hundreds (100s) thousands (1,000s) ten thousands (10,000s) mentally inverse round estimate	Place value charts  Place value counters  Base ten equipment  Numicon	**Maze 100** ** **Reach 100** ***

• Add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction)	Knows the efficient written algorithms for addition and subtraction with increasing fluency for large numbers.	Maths resources for teachers | White Rose Maths Steps 2-5 Lo I know to add whole numbers with more than 4 digits. Lo I know to subtract whole numbers more than 4 digits Lo I know to check answers using rounding Lo I know using the inverse operation.	**Addition and Subtraction calculation methods**	add subtract ones (Is) tens (IOs) hundreds (IOOs) thousands (I,OOOs) ten thousands (IO,OOOs) inverse round estimate	Place value charts  Place value counters  Base ten equipment  Numicon	**Twenty Divided Into Six** ** **Six Ten Total** ** I **Six Numbered Cubes** ** **Subtraction Surprise** *
• Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	Knows how to find factor pairs.	Maths resources for teachers | White Rose Maths Steps I-4 Lo: I know multiples Lo : I know how to find common multiples	**Multiplication and division**	prime number composite number square number cube number square (2) cube (3) inverse operation multiply divide		**Which Is Quicker?** * **Multiplication Squares** * I **Factors and Multiples Game** * G

		Lo: I know factors Lo : I know common factors Lo I know how to calculate square numbers Lo: I know how to calculate cube numbers		multiple factor prime factor		
• 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		Maths resources for teachers | White Rose Maths Steps 5 Lo: I know what prime numbers are. Lo I know to identify prime numbers to 100.	**Prime numbers**			**Abundant Numbers** * I
• Recognise and use square numbers and cube numbers,	Knows how to solve integer scaling problems and harder correspondence problems.	Maths resources for teachers | White Rose Maths Steps 6 and 7	**multiplication and division** **Square and cubed numbers**	square number cube number square (2) cube (3)		**Sweets in a Box** * I

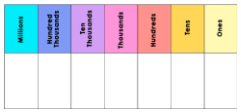
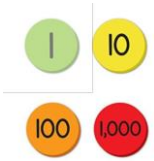
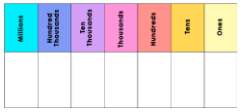
and the notation for squared (2) and cubed (3)		Lo I know how to calculate square numbers Lo: I know how to calculate cube numbers				
• Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	Knows and applies table facts for recall of multiplication and division facts when calculating.	Steps 8 to 10 Lo I know to multiply by 10,100 and 1000 Lo I know to divide by 10, 100 and 1000 Lo I know to calculate multiples of 10, 100 and 1000.	**Multiplication and division 10,100 and 1000**	inverse operation multiply divide multiple factor		
• Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths		Steps 1 to 3 LO I know to find fractions equivalent to a non-unit fraction Lo I know to find fractions equivalent to a unit fraction LO I know to recognise equivalent fractions	**Fractions : Converting, adding and subtracting**	equivalent numerator denominator whole fraction simplify expand division improper mixed number	Fraction tiles  Cuisenaire rods 	**Tumbling Down** **Balance of Halves**

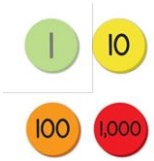
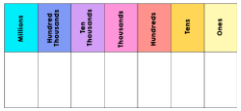
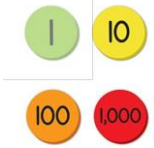
					Fractions circles  Numicon 	
• Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number	Knows how to add and subtract fractions with the same denominator.	Steps 4– 5 Lo I know to convert improper fractions to mixed numbers Lo I know to convert mixed numbers to improper fractions	**Fractions: improper and mixed numbers**	equivalent numerator denominator whole fraction simplify expand division improper mixed number	Fraction tiles  Cuisenaire rods  Fractions circles  Numicon 	**A4 Fraction Addition** * **A4 Fraction Subtraction** * **Linked Chains**

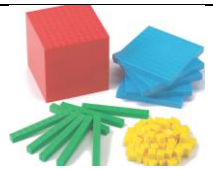
• Multiply numbers up to four digits by a 1- or 2-digit number using a formal written method, including long multiplication for 2-digit numbers	To multiply 3 x 1 digit numbers and recall all multiplication facts with speed and accuracy.	Steps 1 -6 Lo I know how to multiply a 4 digit number by a 1 digit number Lo I know how to multiply a 2 digit number by a 2 digit number Lo I know how to multiply a 3 digit number by a 2 digit number Lo I know how to multiply a 4 by 2 digit number Lo I know how to apply my methods to solve problems	**Multiplication – short and long multiplication**	inverse operation multiply divide multiple factor	Place value counters  Base ten equipment 	**All the Digits** ** **Trebling** *
• Measure and calculate the perimeter of composite rectilinear shapes	Calculating perimeters by counting the length of sides	Steps 1- 6 Lo To know how to find the perimeter of rectangles	**Area and perimeter**	Length, Side, Perimeter Area, Rectangle, rectilinear, Area	Ruler	**Shaping It** * I **Brush Loads** * I **Cubes** * I

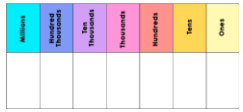
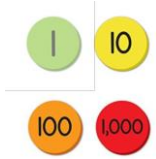
in centimetres and metres		Lo To know how to find the perimeter of rectilinear shapes Lo To know how to find the perimeter of regular polygons Lo To know how to find the area of rectangles Lo To know how to find the area of compound shapes. Lo To estimate the area of different shapes.		Polygon Compound shape Regular shape Irregular shape		**Numerically Equal** ** **Making Boxes** ** I **Ribbon Squares** *** **Fitted** ***

Year 5 Spring term

National curriculum objectives	Prior knowledge from year 4	Learning outcomes (including WR steps)	Mathematical aspect	Vocabulary	Manipulatives	Problem solving resources
Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit	Knows the properties of place value for four-digit numbers. Knows the rules of rounding.	Y5-autumn-block-1-sol-place-value.pdf (whiterosemaths.com) Step 10 – 11 Lo I know to order and compare numbers to 100,000 Lo I know to order and compare numbers to 1,000,000	**Place value : ordering**	ones (Is) tens (IOs) hundreds (IOOs) thousands (I,OOOs) ten thousands (IO,OOOs) place value partition estimate round compare order equivalent greater than (>) less than (<) convert	Place value charts  Place value counters  Base ten equipment 	**Space Distances** *
Round any number up to I,000,000 to the nearest IO, IOO,	Knows the rules of rounding.	Lo I know to round to the nearest IO	**Place Value : rounding**	ones (Is) tens (IOs) hundreds (IOOs) thousands (I,OOOs)	Place value charts 	**Space Distances** *

1,000, 10,000 and 100,000		Lo I know to round to the nearest 100 Lo I know to round to the nearest 1000 Lo I know to round to the nearest 10, 100 and 1000 Lo I know to round within 100,000 Lo I know to round within 1,000,000		ten thousands (10,000s) place value partition estimate round compare order equivalent greater than (>) less than (<) convert	Place value counters  Base ten equipment 	
• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Knows how to check the accuracy of addition and subtraction calculations.	Maths resources for teachers | White Rose Maths Steps 6 – 8 Lo I know how to solve multi-step addition and subtraction problems Lo I know to complete calculations using the inverse		add subtract ones (1s) tens (10s) hundreds (100s) thousands (1,000s) ten thousands (10,000s) inverse round estimate	Place value charts  Place value counters  Base ten equipment	Twenty Divided Into Six ** Maze 100 ** Six Ten Total ** I Six Numbered Cubes ** Reach 100 *** Subtraction Surprise *

		LO - I know how to find missing numbers			 Numicon 	
• Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > I as a mixed number	Knows how to add and subtract fractions with the same denominator.	Maths resources for teachers | White Rose Maths (whiteroseeducation.com) Fractions A Steps 12 -17 LO I know to add to a mixed number LO I know to add two mixed numbers together LO I know to subtract fractions LO I know to subtract from a mixed number	**Fractions ; Calculating with mixed numbers**	equivalent numerator denominator whole fraction simplify expand division improper mixed number convert sequence order greater than (>) less than (<) equal to (=)	Fraction tiles  Cuisenaire rods  Fractions circles  Numicon 	**Tumbling Down** **Balance of Halves** * **A4 Fraction Addition** * **A4 Fraction Subtraction** * **Linked Chains** *

		LO I know to subtract from a mixed number (Partitioning the whole) LO I know to subtract two mixed numbers.				
• Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	Knows the number system from zero into negative numbers.	Maths resources for teachers | White Rose Maths (whiteroseeducation.com) Steps 1 – 4 LO I know how negative numbers work LO I know to count through zero in 1's LO I know to count through zero in multiples LO I know to compare and order negative numbers	**Number: Negative numbers**	place value partition estimate round compare order equivalent greater than (>) less than (<) negative numbers less than zero zero	Place value charts  Place value counters  Base ten equipment 	**Tug Harder!** * G **Swimming Pool*** **Sea Level** * I

•		Maths resources for teachers | White Rose Maths (whiteroseeducation.com) Step 5 LO I know to multiply 4 by 2 digit numbers LO I know to solve	Calculation: multiplication and division			

Year 5 Summer term

National curriculum objectives	Prior knowledge from year 1	Learning outcomes (including WR steps)	Mathematical aspect	Vocabulary	Manipulatives	Problem solving resources
•						