Maths at Cumberworth First School

Teaching for Mastery
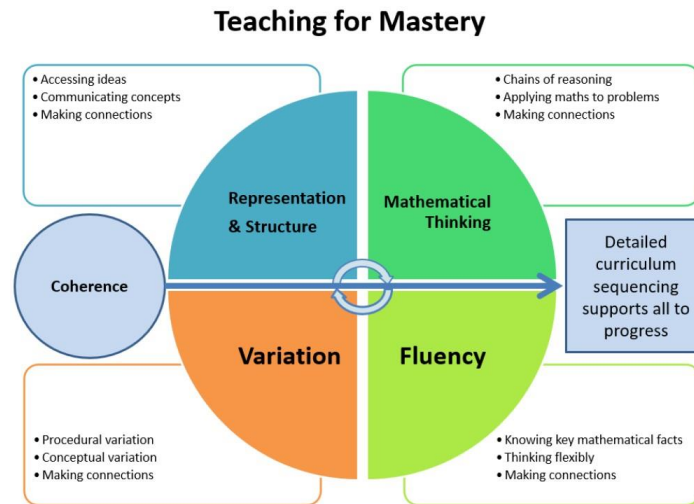

Intent

At Cumberworth First School we want pupils to have a positive view of maths, be fluent in the fundamentals of mathematics and through the enriching experiences we provide become resilient at reasoning, problem solving and able to draw links across the subject and broader curriculum.

Implementation

Throughout school, we teach maths in a variety of different ways e.g. learning through play & exploration, practical activities, 'Outdoor Maths', learning maths facts 'off by heart' and written tasks. We also use a range of ICT programmes to help children consolidate their learning, such as IXL and TT Rockstars.

Lessons involve a brief recapping and consolidation of knowledge they already have. We use the Mastery approach for teaching to deliver the requirements of the EYFS Framework and the National Curriculum. Planning and resources are carefully selected from DFE backed sources: NCTEM and White Rose. We build understanding using the concrete, pictorial, abstract approach. Teachers select the

Enjoy Enrich Excel

most suitable resources to ensure progression and allow children to go deeper into their learning. Lessons are based on the principles that all children can achieve. They are all exposed to the same content, offered the same opportunities and then given tasks to enrich and stretch this learning. Teachers active mark through the lesson providing immediate feedback and intervention where needed.

We want our children to be confident mathematicians who are able to apply their knowledge across the curriculum and therefore we provide a range of opportunities for this to happen: science (e.g. recording data in a bar chart; measuring); history (e.g. timelines); geography (e.g. positional language); Design Technology (e.g. measuring, weighing ingredients).

We follow the Shelley Pyramid First and Middle Schools Calculation Policy. This ensures clear progression and gives consistency in the teaching of calculation strategies across our pyramid first schools in preparation for moving on to Middle School.

Impact

- Pupils are enthused about their mathematical learning; talking about it positively using correct mathematical terminology and eager to attempt challenges.
- Pupils are able to make connections to previous learning and have a 'can do' attitude towards their work.
- Pupils are able to quickly and accurately recall key mathematical facts.
- Pupils can find more than one way to solve a calculation, look for patterns within the numbers, find the most efficient way to complete a calculation whilst appreciating there is often more than one way to solve a given challenge.

Assessment

- Teachers actively assess during every lesson providing immediate feedback to move learning forward.
- End of unit assessments are carried out from the White Rose scheme.
- End of term NFER assessments are carried out to keep track of pupil attainment and progression.

Reception Curriculum Map

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Getting to know you		Match, sort and compare		Talk about measure and patterns		It's me 1, 2, 3		Circles and triangles	1, 2, 3, 4, 5		Shapes with 4 sides
Spring	Alive in 5		Mass and capacity	Growing 6, 7, 8		Length, height and time		Building 9 and 10			Explore 3-D shapes	
Summer	To 20 and beyond		How many now?	Manipulate, compose and decompose		Sharing and grouping		Visualise, build and map			Make connections	Consolidation

Year 1 Curriculum Map

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value (within 10)**					Number **Addition and subtraction (within 10)**					Geometry **Shape**	Consolidation
Spring	Number **Place value (within 20)**			Number **Addition and subtraction (within 20)**			Number **Place value (within 50)**		Measurement **Length and height**		Measurement **Mass and volume**	
Summer	Number **Multiplication and division**			Number **Fractions**		Geometry **Position and direction**	Number **Place value (within 100)**		Measurement **Money**	Measurement **Time**		Consolidation

Year 2 Curriculum Map

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**				Number **Addition and subtraction**					Geometry **Shape**		
Spring	Measurement **Money**		Number **Multiplication and division**					Measurement **Length and height**		Measurement **Mass, capacity and temperature**		
Summer	Number **Fractions**			Measurement **Time**			Statistics		Geometry **Position and direction**		Consolidation	

Year 3 Curriculum Map

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**			Number **Addition and subtraction**					Number **Multiplication and division A**			
Spring	Number **Multiplication and division B**			Measurement **Length and perimeter**			Number **Fractions A**			Measurement **Mass and capacity**		
Summer	Number **Fractions B**		Measurement **Money**		Measurement **Time**			Geometry **Shape**		Statistics		Consolidation

Year 4 Curriculum Map

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**				Number **Addition and subtraction**			Measurement **Area**	Number **Multiplication and division A**			Consolidation
Spring	Number **Multiplication and division B**			Measurement **Length and perimeter**		Number **Fractions**				Number **Decimals A**		
Summer	Number **Decimals B**		Measurement **Money**		Measurement **Time**		Consolidation	Geometry **Shape**		Statistics	Geometry **Position and direction**	

Year 5 Curriculum Map

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**			Number **Addition and subtraction**		Number **Multiplication and division A**			Number **Fractions A**			
Spring	Number **Multiplication and division B**			Number **Fractions B**		Number **Decimals and percentages**			Measurement **Perimeter and area**		**Statistics**	
Summer	Geometry **Shape**			Geometry **Position and direction**		Number **Decimals**			Number **Negative numbers**	Measurement **Converting units**		Measurement **Volume**

Whole School Skills Progression

	Year 1	Year 2	Year 3	Year 4	Year 5
Counting	•count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number •count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	•count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward	•count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.	•count in multiples of 6, 7, 9, 25 and 1000 •find 1000 more or less than a given number count backwards through zero to include negative numbers	•count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 •interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
Place Value		•recognise the place value of each digit in a two-digit number •compare and order numbers from 0 up to 100; use <, > and = signs	•recognise the place value of each digit in a three-digit number •compare and order numbers up to 1000	•recognise the place value of each digit in a four-digit number •order and compare numbers beyond 1000 •round any number to the nearest 10, 100 or 1000	•read, write, order and compare numbers up to 1 000 000 and determine the value of each digit •round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
Representing number	•identify and represent numbers using objects and pictorial representations including the number line, & use language of: equal to, more than, less than (fewer), most, least •read and write numbers from 1 to 20 in numerals and words •read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	•identify, represent and estimate numbers using different representations, including the number line •read and write numbers to at least 100 in numerals and in words	•identify, represent and estimate numbers using different representations •read and write numbers up to 1000 in numerals and in words	•identify, represent and estimate numbers using different representations •read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	•read Roman numerals to 1000 (M) and recognise years written in Roman numerals •recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)
Number facts (+/-)	•given a number, identify one more and one less •represent and use number bonds and related subtraction facts within 20	•use place value and number facts to solve problems recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100			
Mental +/-	•add and subtract one-digit and two-digit numbers to 20, including zero	•add and subtract numbers using concrete objects, pictorial representations, and mentally, including: TU+U, TU+T, TU+TU and U+U+U •show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	•add and subtract numbers mentally, including: HTU+U, HTU+T and HTU+H		•add and subtract numbers mentally with increasingly large numbers
Written +/-			•add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	•add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	•add and subtract whole numbers with more than 4 digits, including using formal written methods
Problems +/-	•solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ − 9.	•solve problems with addition and subtraction, using concrete, pictorial and abstract representations •recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	•estimate the answer to a calculation and use inverse operations to check answers •solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	•estimate and use inverse operations to check answers to a calculation •solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	•use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy •solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Number facts (x/÷)		•recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	•recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	•recall multiplication and division facts for multiplication tables up to 12 × 12	•identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers •know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers •establish whether a number up to 100 is prime and recall prime numbers up to 19
Mental (x/÷)		•calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs •show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	•write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods	•use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers •recognise and use factor pairs and commutativity in mental calculations	•multiply and divide numbers mentally drawing upon known facts •multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
Written (x/÷)			•Progress to formal written methods calculations as above	•multiply two-digit and three-digit numbers by a one-digit number using formal written layout	•multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers •divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
Problems (x/÷)	•solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	•solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	•solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	•solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	•solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes •solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign •solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
Recognising fractions	•recognise, find and name a half as one of two equal parts of an object, shape or quantity •recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	•recognise, find, name and write fractions 1/3, 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity	•count up and down in tenths; •recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	•count up and down in hundredths; •recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	•recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number

Menu	Year 1	Year 2	Year 3	Year 4	Year 5
Comparing fractions			•compare and order unit fractions, and fractions with the same denominators •recognise and show, using diagrams, equivalent fractions with small denominators	•recognise and show, using diagrams, families of common equivalent fractions	•compare and order fractions whose denominators are all multiples of the same number •identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
Finding fractions of quantities			•recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators •recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	•solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	
Fraction calculations		•write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2.	•add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7]	•add and subtract fractions with the same denominator	•add and subtract fractions with the same denominator and denominators that are multiples of the same number •multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
Decimals as fractional amounts				•recognise and write decimal equivalents of any number of tenths or hundredths •recognise and write decimal equivalents to ¼, ½ and ¾ •find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	•read and write decimal numbers as fractions
Ordering decimals				•round decimals with one decimal place to the nearest whole number •compare numbers with the same number of decimal places up to two decimal places	•recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents •round decimals with two decimal places to the nearest whole number and to one decimal place •read, write, order and compare numbers with up to three decimal places
Calculating with decimals					
Percentages					•recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
Fraction problems			•solve problems using all fraction knowledge	•solve simple measure and money problems involving fractions and decimals to two decimal places	•solve problems involving number up to three decimal places •solve problems which require knowing percentage and decimal equivalents of ½ , ¼ , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25
Ratio & Proportion					
Algebra					
Measures	•compare, describe and solve practical problems for: length/height, weight/mass, capacity/volume & time •measure and begin to record length/height, weight/mass, capacity/volume & time	•choose and use appropriate standard units to estimate and measure length/height (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels •compare and order lengths, mass, volume/capacity and record the results using >, < and =	•measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	•Convert between different units of measure estimate, compare and calculate different measures, including money in pounds and pence	•convert between different units of metric measure •understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints •estimate volume and capacity
Mensuration			•measure the perimeter of simple 2-D shapes	•measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares	•measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres •calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes