Maths - Curriculum Overview

Curriculum Intent

At Netherton Infants School we see Maths very much as a multi-discipline, cross curricular, interconnected subject which should encourage creativity. As much revolves around the discussion about Maths between talk partners as it does the completion of calculations. We want the children to see Mathematics as being relevant to their world and applicable to everyday life as well as being something that they will need as they move on through their school life and ultimately to the world of employment. To that end, a high-quality, inter-related and creative Maths experience should be one that develops the children's ability to think mathematically and one which allows them to apply the tools to which they have been exposed in a variety of ways.

Our curriculum allows pupils to:

- 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.

In addition to the National Curriculum aims, our school vision sets out the following aims which will be achieved through the teaching of high-quality geography sequences of learning:

- Pupils are happy in their learning and set high expectations of themselves in all areas
- Children taking ownership of their own learning journey

- We have an engaging, ambitious and inclusive curriculum which results in happy learners
- We celebrate and share our successes

The Maths curriculum reflects our school values in the following ways:

Ready:

We always try our best
We keep going when things get difficult
We set high expectations of ourselves
We are positive about new challenges

Respectful:

We look after our environment and our equipment
We respect difference and know that we are all equal

Responsible:

We look after ourselves and each other

	Number: Number and Place Value - Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.	Count objects, actions and sounds. Subitise. Link the number symbol (numeral) with its cardinal number value. Count beyond ten. Compare numbers. Understand the 'one more than/one less than' relationship between consecutive numbers.	**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. Given a number, identify one more and one less. **Comparing Number** Use the language of: equal to, more than, less than (fewer), most, least. **Identify, Representing and Estimating Numbers** Identify and represent numbers using objects and pictorial representations including the number line. **Reading and Writing Numbers** Read and write numbers from 1 to 20 in numerals and words. **Problem Solving** Use place value and number facts to solve problems	**Counting** Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward. **Comparing Number** Compare and order numbers from 0 up to 100; use <, > and = signs. **Identify, Representing and Estimating Numbers** Identify, represent and estimate numbers using different representations, including the number line. **Reading and Writing Numbers** Read and write numbers to at least 100 in numerals and in words. **Understanding Place Value** Recognise the place value of each digit in a two-digit number (tens, ones). **Problem Solving** Solve number problems and practical problems involving these ideas.

	Number: Addition and Subtraction - Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge	Experiment with their own symbols and marks as well as numerals. Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'more than', 'fewer than'.	Explore the composition of numbers to 10. Automatically recall number bonds for numbers 0–5 and some to 10.	**Number Bonds** Represent and use number bonds and related subtraction facts within 20. **Mental calculations** Add and subtract one-digit and two-digit numbers to 20, including zero Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) **Written Methods** Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) **Problem Solving** Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	**Number Bonds** Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. **Mental calculations** add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers adding three one-digit numbers Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. **Inverse operations, Estimating and Checking answers** Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. **Problem Solving** Solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods. *solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change* (copied from Measurement)

	Multiplication and Division – Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge			**Multiplication and Division facts** *Count in multiples of twos, fives and tens* (copied from Number and Place Value) **Problem Solving** 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.	**Multiplication and Division facts** *Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward.* (copied from Number and Place Value) Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. **Mental Calculation** Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. **Written Calculation** Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. **Problem Solving** Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

	Fractions – Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge			**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	**Counting in Fractional Steps** *Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)* **Recognising Fractions** Recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity **Equivalence (including fractions)** write simple fractions e.g. $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$.

	Measurement – Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge		Compare length, weight and capacity.	**Comparing and Estimating** Compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than]	**Comparing and Estimating** Compare and order lengths, mass, volume/capacity and record the results using >, < and =.

			* capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] time [e.g. quicker, slower, earlier, later]. Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]. **Measuring and Calculating** Measure and begin to record the following: * **lengths and heights** * **mass/weight** * **capacity and volume** * **time** (hours, minutes, seconds**)** Recognise and know the value of different denominations of **coins and notes.** **Telling the Time** Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. Recognise and use language relating to dates, including days of the week, weeks, months and years.	Compare and sequence intervals of time. **Measuring and Calculating** Choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm); **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. Recognise and use symbols for pounds **(£) and pence (p)**; combine amounts to make a particular value. Find different combinations of coins that equal the same amounts of money. **Solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change. **Telling the Time** Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. Know the number of minutes in an hour and the number of hours in a day. (appears also in Converting) **Converting** Know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)

	Geometry: Properties of Shape – Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge	Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. Combine shapes to make new ones – an arch, a bigger triangle, etc.	Select, rotate and manipulate shapes to develop spatial reasoning skills. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. Continue, copy and create repeating patterns	**Identifying Shapes and their Properties** Recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	**Identifying Shapes and their Properties** Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line. Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces. Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] **Comparing and Classifying** Compare and sort common 2-D and 3-D shapes and everyday objects.

	Geometry: Position and Direction – Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge	Understand position through words alone – for example, "The bag is under the table," – with no pointing.		**Position, Direction and Movement** Describe position, direction and movement, including half, quarter and three-quarter turns.	**Position, Direction and Movement** Use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and

	Describe a familiar route. Make comparisons between objects relating to size, length, weight and capacity. Discuss routes and locations, using words like 'in front of' and 'behind'. Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'			anti-clockwise) **<u>Pattern</u>** Order and arrange combinations of mathematical objects in patterns and sequences

	Statistics – Knowledge and Skills Progression			
	Nursery	**Reception**	**Y1**	**Y2**
Knowledge				**<u>Interpreting, Constructing and Presenting Data</u>**

				Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totaling and comparing categorical data

	Vocabulary Progression			
	Nursery	**Reception**	**Year 1**	**Year 2**
Number and	Number One, two,	Subitising	Number	Numbers to one hundred

Place Value	three to twenty and beyond. None Zero Count on/up/to/from/down Before, after More than Fewer than, fewest, smaller, smallest	Five frame Tens frame Number tracks Hundreds square Two-digit number Equal to The same as Less than Number bonds	Zero, one, two, three to twenty, and beyond None Count (on/up/to/from/ down) Before, after More, less, many, few, fewer, least, fewest, smallest, greater, lesser Equal to, the same as Odd, even Pair Units, ones, tens Ten more/less Digit Numeral Figure(s) Compare (In) order/a different order Size Value Between, halfway between Above, below Partition, recombine Part-whole model Bar model	Hundreds Hundred more/less
Addition and Subtraction	N/A	And	Equation Number bonds, number line Add, more, plus, make, sum, total, altogether Inverse Double, near double Half, halve Equals, is the same as (including equals sign) Difference between How many more to make..?, how many more is…than..?, how much more is..? Subtract, take away, minus How many fewer is…than..?, how much less is..?	

Multiplication and Division	N/A	N/A	Odd, even Count in twos, threes, fives Count in tens (forwards from/backwards from) How many times? Lots of, groups of Once, twice, three times, five times Multiple of, times, multiply, multiply by Repeated addition Array, row, column Double, halve Share, share equally Group in pairs, threes, etc. Equal groups of Divide, divided by, left, left over	
Fractions	N/A	N/A	Whole Equal parts, four equal parts One half, two halves A quarter, two quarters	Three quarters, one third, a third Equivalence, equivalent
Measurement	Larger Small Morning, afternoon, evening, night, day, Earlier Later Too late Too soon In a minute Yesterday Tomorrow	Heavier Holds more/less	Full, half full, empty Holds Container Weigh, weighs, balances Heavy, heavier, heaviest, light, lighter, lightest Scales Time Days of the week: Monday, Tuesday, etc. Seasons: spring, summer, autumn, winter Week, month, year, weekend Birthday, holiday midnight Bedtime, dinnertime, playtime Today, Next, last	Quarter past/to m/km, g/kg, ml/l Temperature (degrees)

			Now, soon, early, late Quick, quicker, quickest, quickly , fast, faster, fastest, slow, slower, slowest, slowly Old, older, oldest, new, newer, newest Takes longer, takes less time Hour, o'clock, half past Clock, watch, hands How long ago?, how long will it be to…?, how long will it take to…?, how often? Always, never, often, sometimes, usually Once, twice First, second, third, etc. Estimate, close to, about the same as, just over, just under Too many, too few, not enough, enough Length, width, height, depth Long, longer, longest, short, shorter shortest, tall, taller, tallest, high, higher, highest Low, wide, narrow, deep, shallow, thick, thin Far, near, close Metre, ruler, metre stick Money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change, dear(er), costs more, costs less, cheaper, costs the same as How much?, how many? Total	
Shape	Circle Rectangles Triangles Cuboids etc Side	Continue with 2d and 3d shape names and properties	Group, sort Cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square Shape	Size Bigger, larger, smaller Symmetrical, line of symmetry Fold Match

	Corners Straight Flat round		Flat, curved, straight, round Hollow, solid Face, edge Make, build, draw	Mirror line, reflection Pattern, repeating pattern
Position and Direction	In front of Behind In On Up Under Down Besides Between Off Exactly First Then After Before		Position Over, underneath, above, below, top, bottom, side on, in, outside, inside around Front, back Beside, next to, Opposite Apart Between, middle, edge, centre Corner Direction Journey Left, right, forwards, backwards, sideways Across Close, far, near Along, through To, from, towards, away from Movement Slide, roll, turn, whole turn, half turn Stretch, bend	Rotation Clockwise, anticlockwise Straight line Ninety degree turn, right angle
Statistics	N/A	N/A		Count, tally, sort Vote Graph, block graph, pictogram, Represent Group, set, list, table Label, title Most popular, most common, least popular, least common