Maths – Knowledge Progression Overview

<u>Intent</u>

At Manor Park Infant and Nursery School, we strive to make maths fun, purposeful and interesting for all children. We aim to equip all pupils with the skills and confidence to solve a range of problems through fluency with numbers and mathematical reasoning. Children are encouraged to see the mathematics that surround them every day and enjoy developing vital life skills in this subject. We use White Rose to underpin our planning. We aim for every child to develop a sound understanding of maths, equipping them with the skills of calculation, reasoning and problem solving that they need in life beyond school. They will be given access to a variety of mathematical opportunities, which will enable them to make the connections in learning, develop and use new vocabulary and discuss their learning. By working across different representations of learning and using resources, we aim for our children to be confident mathematicians who are independent, inquisitive and not afraid to take risks.

EYFS DFE definition:

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

The national curriculum for mathematics aims to ensure that all pupils:

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

Implementation

Our curriculum incorporates the coverage of the statutory outcomes outlined in the Early Years Foundation Stage and KS1 Mathematics Programme of Study – National Curriculum 2014. Our planning is based on the White Rose Maths Schemes of Learning to guarantee consistency, coherence and progression throughout the EYFS and KS1. In addition, staff refer to other materials to support short-term planning. These are used across EYFS and KS1 allowing children to be exposed to a variety of different types of learning and problems to solve. Teachers implement our schools' agreed Calculation Policy. To learn mathematics effectively, some things have to be learned before others and this order of small step learning is factored into our planning (e.g. place value needs to be understood before working with addition). At Manor Park Infant and Nursery School, we have an emphasis on number skills first, carefully ordered, throughout the curriculum. Our pupils engage and enjoy using concrete resources to experiment and complete practical activities. Our pupils also use pictorial representations. These representations can then be used to help reason and solve problems. Using both concrete and pictorial representations enables the children to understand abstract methods.

Children take part in explicit daily mathematics lessons with a specific focus on either Number or Measure, Geometry or Statistics. All areas of the mathematics curriculum are continually revisited through planned short or longer in-depth teaching sequences to enable children to develop a depth of understanding. At Manor Park Infant and Nursery School, we regularly give our children opportunities to use and apply their mathematical learning in everyday situations, aiming to embed mathematical skills across the curriculum.

Impact

The impact of our high-quality maths curriculum will develop children who are confident, keen and unafraid mathematicians who are equipped with a wealth of knowledge to draw upon to solve problems.

We measure how well we are doing by:

- Assessing our children's outcomes against the ELGs for EYFS and the end of Key stage 1 expectations for Y1 and Y2.
- Monitoring the work children do and their response and attitudes to learning.
- Speaking with children so that they can demonstrate their developing skills and knowledge and show what they know, can do and to check they remember more than they did before.

Coverage and	F1	F2	Yr 1	Yr 2
Progression				
Place Value:	 Develop fast 	Consolidate F1	 Count to and 	• Count in steps of 2,
Count	recognition of	and	across 100,	3, and 5 from 0, and
	up to 3 objects,		forwards and	in tens from any
	without having	 Count objects, 	backwards,	number, forward
	to count them	actions and	beginning with	and backward
	individually	sounds.	0 or 1, or from	
	('subitising').		any given	
	 Recite 	 Subitise 	number	
	numbers past 5.		 Count 	
	 Say one 	 Link the 	numbers to 100	
	number for	number symbol	in numerals;	
	each item in	(numeral) with	count in	
	order: 1,2,3,4,5.	its cardinal	multiples of	
	 Know that the 	number value.	twos, fives and	
	last number		tens	
	reached when	 Count beyond 		
	counting a small	ten.		
	set of objects			
	tells you how			
	many there are			
	in total			
	('cardinal			
	principle').			
	 Show 'finger 			
	numbers' up to			
	5. Link numerals			

Maths – Knowledge Progression Overview

	and amounts:			
	for example.			
	showing the			
	right number of			
	match the			
	numeral, up to			
-	5.			
Place Value:	 Experiment 	•Explore the	 Identify and 	 Read and write
Represent	with their own	composition of	represent	numbers to at least
	symbols and	numbers to 10.	numbers using	100 in numerals and
	marks as well as		objects and	in words
	numerals. Solve		pictorial	 Identify, represent
	real world		representations	and estimate
	mathematical		 Read and 	numbers using
	problems with		write numbers	different
	numbers up to		to 100 in	representations,
	5.		numerals	including the
			Read and	number line
			write numbers	
			from 1 to 20 in	
			numerals and	
			words	
Place Value:	•Compare	•Compare	• Given a	Recognise the
Lise and Compare		numbers	number	nlace value of each
Use and compare	language: 'more	•Understand	identify one	digit in a two-digit
	than' 'fowor	the fone more	more and one	number (tens, ones)
	than'	the one more		Compare and
	Uldil	than'	less	• Compare and
		Liidii rolotionshin		Order numbers from
		relationship		0 up to 100; use and
		between		= signs
		consecutive		
		numbers.		
Place Value:				Use place value
Problems/				and number facts to
Rounding				solve problems
Coverage and	F1	F2	Yr 1	Yr 2
Progression				
Addition and		 Automatically 	 Represent and 	 Secure fluency in
Subtraction:		recall number	use number	addition and
Number facts		bonds for	bonds and	subtraction facts
		numbers 0–5	related	within 10, through
		and some to 10.	subtraction	continued practice.
			facts within 20	
				 Recall and use
			 Count 	addition and
			forwards and	subtraction facts to
			backwards in	20 fluently and
			multiples of 2 5	derive and use
			and $10 \text{ up to } 10$	related facts up to
			multiples	
			•Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples,	addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

			beginning with	
			any multiple	
			and count	
			forwards and	
			ioi wai us aliu	
			Dackwards	
			through the odd	
			numbers.	
Addition and		 Begin to use 	 Add and 	 Add and subtract
Subtraction:		the + - = signs to	subtract one-	numbers using
Calculations		record	digit and two-	concrete objects,
		calculations	digit numbers to	pictorial
			20, including	representations, and
			zero	mentally, including:
				Ø a two-digit
				number and ones
				Ø a two-digit
				number and tens
				d two two digit
				v two two-uigit
				Ø adding three one-
				digit numbers
Addition and			Solve one-step	 Solve problems
Subtraction:			problems that	with addition and
Problems			involve addition	subtraction:
			and subtraction,	Ø using concrete
			using concrete	objects and pictorial
			objects and	representations,
			pictorial	including those
			representations,	involving numbers,
			and missing	quantities and
			number	measures
			problems such	Ø applying their
			as 7 = 2 - 9	increasing
			us / - : J	knowledge of mental
				and written methods
	F4	52	N.A.	
Coverage and	F1	FZ	Yr 1	Yr 2
Multiplication				Pocall and use
and Division				• Necali dilu use
				multiplication and
Recall/Use				division facts for the
				2, 5 and 10
				multiplication tables,
				including recognising
				odd and even
				numbers
				 Show that
				multiplication of two
				numbers can be
				done in any order
				, (commutative) and
				division of one

				number by another
				cannot
Multiplication				 Calculate
and Division:				mathematical
Calculations				statements for
				multiplication and
				division within the
				multiplication tables
				and write them using
				the multiplication
				(×), division (÷) and
				equals (=) signs
Multiplication			Solve one-step	Solve problems
and Division:			problems	involving
Problems			involving	multiplication and
			multiplication	division, using
			and division, by	materials, arrays,
			calculating the	repeated addition,
			answer using	mental methods,
			concrete	and multiplication
			objects, pictorial	and division facts,
			representations	including problems
			and arrays with	in contexts
			the support of	
			the teacher	
			the teacher	
Coverage and	F1	F2	Yr 1	Yr 2
Coverage and Progression	F1	F2	Yr 1	Yr 2
Coverage and Progression Fractions:	F1	F2	• Recognise,	Yr 2 • Recognise, find,
Coverage and Progression Fractions: Recognise and	F1	F2	• Recognise, find and name a	Yr 2 • Recognise, find, name and write
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of two equal parts	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length,
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of two equal parts of an object,	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of two equal parts of an object, shape or	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of two equal parts of an object, shape or quantity	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of two equal parts of an object, shape or quantity • Recognise,	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	• Recognise, find and name a half as one of two equal parts of an object, shape or quantity • Recognise, find and name a	Yr 2 • Recognise, find, name and write fractions 1/3, ¼ , 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	 • 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	 • 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	 Yr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity
Coverage and Progression Fractions: Recognise and Write	F1	F2	 Pr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the
Coverage and Progression Fractions: Recognise and Write Fractions: Compare	F1	F2	 Yr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4
Coverage and Progression Fractions: Recognise and Write Fractions: Compare	F1	F2	 Yr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4 and a 1/2
Coverage and Progression Fractions: Recognise and Write Fractions: Compare	F1	F2	 Yr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4 and a 1/2 • write simple
Coverage and Progression Fractions: Recognise and Write Fractions: Compare Fractions: Calculations	F1	F2	 Yr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4 and a 1/2 • write simple fractions for avample 1/2 of 6 = 2
Coverage and Progression Fractions: Recognise and Write Fractions: Compare Fractions: Calculations	F1	F2	Yr 1 • 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	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4 and a 1/2 • write simple fractions for example, ½ of 6 = 3
Coverage and Progression Fractions: Recognise and Write Fractions: Compare Fractions: Calculations Coverage and	F1	F2	 Yr 1 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 	Yr 2 • Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity • Recognise the equivalence of 2/4 and a 1/2 • write simple fractions for example, ½ of 6 = 3 Yr 2

Measurement:	 Make 	•Compare	• Compare,	Choose and use
Using Measures	comparisons	length, weight	describe and	appropriate standard
	between	and capacity.	solve practical	units to estimate and
	objects relating		problems for:	measure
	to size, length,	 Orders two or 	Ø lengths and	length/height in any
	weight and	three items by	heights	direction (m/cm);
	capacity.	length or height	Ø mass/weight	mass (kg/g);
			Ø capacity and	temperature (°C);
		 Orders two 	volume	capacity (litres/ml)
		items by weight	Ø time	to the nearest
		or capacity	 Measure and 	appropriate unit,
			begin to record	using rulers, scales,
		 Children use 	the following:	thermometers and
		everyday	Ø lengths and	measuring vessels
		language to talk	heights	• Compare and order
		about size,	Ø mass/weight	lengths, mass,
		weight.	Ø capacity and	volume/capacity and
		capacity, to	volume	record the results
		compare	Ø time (hours.	using $>$. < and =
		quantities and	minutes.	
		objects and to	seconds)	
		solve problems.		
Coverage and	F1	F2	Vr 1	Vr 2
Progression		12		11 2
Money		Beginning to	Recognise and	Recognise and use
Money		use everyday	know the value	symbols for nounds
			of different	(f) and nence (n):
		related to	denominations	combine amounts to
		money	of coins and	make a particular
		money.	or coms and	value • find different
		• Children use	notes	value • Intu unterent
		everyday		coms that equal the
				same amounts of
		about money		money • solve
		and to solve		simple problems in a
		problems.		practical context
				involving addition
				and subtraction of
				money of the same
				unit, including giving
				change
Coverage and	F1	F2	Yr 1	Yr 2
Progression			-	
Time	Begin to	• Uses everyday	Sequence	 Compare and
	describe a	language	events in	sequence intervals of
	sequence of	related to time	chronological	time
	events, real	 Orders and 	order using	 Tell and write the
	a set a set a set a la set a set		l longuage [for	time to five main uton
1	or fictional,	sequences	language [lor	time to five minutes,
	using words	sequences familiar events	example, before	including quarter
	using words such as 'first',	sequences familiar events • Measures	example, before and after, next,	including quarter past/to the hour and

		time in simple	vesterdav.	clock face to show
		wavs	tomorrow.	these times
			morning.	Know the number
		Children use	afternoon and	of minutes in an
		evervdav	evening	hour and the
		language to talk	Recognise and	number of hours in a
		about time and	use language	dav
		to solve	relating to	udy
		nrohlems	dates including	
		problems.	days of the	
			wook wooks	
			months and	
			• Toll the time	
			• Ten the time	
			to the nour and	
			han past the	
			nour and draw	
			the hands on a	
			clock face to	
			show these	
			times	
Coverage and	F1	F2	Yr 1	Yr 2
Progression				
Geometry: 2D	•Talk about and	Consolidate F1	 Recognise and 	 Identify and
Shapes	explore 2D	and	name common	describe the
	shapes for		2-D shapes [for	properties of 2-D
	example, circles,	 Compose and 	example,	shapes, including the
	rectangles,	decompose	rectangles	number of sides and
	triangles) using	shapes so that	(including	line symmetry in a
	informal and	children	squares), circles	vertical line
	mathematical la	recognise a	and triangles]	 Identify 2-D shapes
	nguage: 'sides',	shape can have		on the surface of 3-D
	'corners';	other shapes		shapes, [for
	'straight', 'flat',	within it, just as		example, a circle on
	'round'.	numbers can.		a cylinder and a
				triangle on a
	 Select shapes 	 Continue, copy 		pyramid]
	appropriately:	and create		 Compare and sort
	flat surfaces for	repeating		common 2-D shapes
	building, a	patterns.		and everyday objects
	triangular prism			
	for a roof, etc.	 Uses familiar 		
	Combine shapes	objects and		
	to make new	common shapes		
	ones – an arch,	to create and		
	a bigger	recreate		
	triangle, etc.	patterns and		
		build models		
	•Talk about and			
	identify the	• They		
	patterns around	recognise,		

	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.	create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.		
Geometry: 3D Shapes	•Talk about and explore 3D for example, circles, rectangles, triangles) using informal and mathematical la nguage: 'faces', 'corners', 'flat', 'round'.		 Recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] 	 Recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] compare and sort common 3- D shapes and everyday objects
Geometry: Position and Direction	 Understand position through words alone – for example, "The bag is under the table," – with no pointing Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'. 	 Children use everyday language to talk about, position, distance, and to solve problems. Select, rotate and manipulate shapes to develop spatial reasoning skills. 	 Describe position, direction and movement, including whole, half, quarter and three- quarter turns 	 Order and arrange combinations of mathematical objects in patterns and sequences 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 anticlockwise)

Coverage and	F1	F2	Yr 1	Yr 2
Progression				
Statics: Present				 Interpret and
and Interpret				construct simple
Data				pictograms, tally
				charts, block
				diagrams and simple
				tables
Statics: Solving				 Ask and answer
Statistical				simple questions by
problems				counting the number
				of objects in each
				category and sorting
				the categories by
				quantity
				 Ask and answer
				questions about
				totalling and
				comparing
				categorical data.

Yr 2 Exceeding

Problem solving and reasoning are an integral part of all the units of work and all children are encouraged to reason and explain their mathematical thinking. Higher attainers, who grasp concepts quickly, are challenged through rich reasoning and more demanding problem-solving activities.