

Our Mathematics Curriculum



Our Aim

Our aim in Mathematics is that each child leaves Parkside with the core skills to meet the demands of everyday life in our modern world.

We want all children to use and apply their mathematical skills confidently, use mathematical language effectively and to be fluent mathematical thinkers.

We will achieve this by maximising speaking and listening opportunities, by giving the children time to investigate and by providing problem-solving situations. We want the children to reason with their thoughts and challenge themselves. We want all children at Parkside to love Maths!

Children from Years 1 to 6 will follow the expectations of the National Curriculum. Our KS1 and KS2 Literacy curriculum covers all the areas. In the Early Years Foundation Stage (EYFS), children in Nursery and Reception will follow the expectations of the EYFS Framework. The level of development children should be expected to have attained by the end of the EYFS is defined by early learning goals (ELGs).

Mathematics learning (covering number and numerical patterns) is included within our EYFS curriculum.

White Rose Maths

At Parkside, we use The White Rose Maths programme to support our curriculum design, planning and teaching. The White Rose Maths curriculum is designed to provide children with a solid foundation in mathematics. Our children will gain a deep understanding of mathematics and enjoy solving mathematical problems.

Why have we chosen White Rose Maths?

At Parkside, we believe that all children should have the opportunity to achieve excellence in mathematics and master the curriculum. We want our children to be confident mathematicians who can enjoy working with number. We believe that approaching mathematics using the concrete, pictorial and abstract approach gives children the best opportunity to understand the concept taught, rather than a surface-level understanding through following a method learned by rote. Using White Rose enables children to progress in manageable steps through the different curriculum areas, building on prior learning, whilst also being challenged to develop deep understanding and mastery through thinking about problems in a variety of contexts.

We use White Rose to support our short, medium and long term planning, as the blocks ensure all of the National Curriculum content has been covered by the end of the year. Using the blocks also allows us to ensure each child's progression is clearly mapped, and we can confidently build on a consistent level of prior learning. We use the White Rose small steps to inform short term planning, and while teachers use their professional judgement to adapt steps or sequences to best suit the needs of our children, White Rose resources and approaches inform our delivery of new concepts and ideas.

Our aim is for our young mathematicians to become:

- Confident and able to recall and apply mathematical knowledge in different contexts
- Able to explain their methods and thinking processes and apply skills in context
- Fluent in different areas of maths
- Efficient in applying problem-solving and reasoning skills
- Independent thinkers
- Able to identify patterns and make links between different areas of maths
- Proud to show their mathematical skills

Our Mathematics Overview- Nursery

3 and 4 year olds should:

•Recite numbers past 5. •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. •Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). •Compare quantities using language: 'more than', 'fewer than'. •Make comparisons between objects relating to size, length, weight and capacity	•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'). •Understand position through words alone – for example, "The bag is under the table," – with no pointing.	•Describe a familiar route •Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. •Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.	•Discuss routes and locations, using words like 'in front of' and 'behind'. •Show 'finger numbers' up to 5 •Solve real world mathematical problems with numbers up to 5. •Extend and create ABAB patterns – stick, leaf, stick, leaf.	•Notice and correct an error in a repeating pattern. •Experiment with their own symbols and marks as well as numerals. •Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'
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Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
• Consolidate 1-3 • Ordering • Counting • Finger counting • Comparing quantities • Symbols and marks • Problem solving up to five • 2 and 3D shapes • Composition • Position • Location and Routes • Comparing with measure • Pattern	• Counting • Ordering • Comparing with measures • Finger counting to 5 • Symbols and marks • Problem solving up to 5 • 2 and 3D shapes • Position • Location/routes • Comparing with measures	• Basic pattern • Counting • Ordering • Finger numbers up to 5 • Symbols and marks • Comparing quantities • 2 and 3D shapes • Pattern • Sequencing	• Subitising • Counting • Ordering • Sorting and matching • Finger numbers up to 5 • Symbols and marks • Counting • Ordering • Matching • Comparing quantities • 2 and 3D shapes	• Simple shape • Comparing Measures • Composition • Solve problems up to 5 and beyond • Symbols and marks • Comparing quantities • Counting • Sequencing	• Counting • Positions • Sequencing • Solving problems beyond 5 • Pattern • Counting • Comparing measures

Our Mathematics Overview- Reception

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Getting to know you Routines for learning maths.	It's me 1, 2, 3! Representing 1, 2 & 3 Comparing 1, 2 & 3 Composition of 1, 2 & 3 Shape: Circles and triangles Positional language.	Alive in 5! Introducing zero Comparing numbers to 5 Composition of 4 & 5 Compare mass advanced Compare capacity advanced.	Building 9 & 10 Counting to 9 & 10 Comparing numbers to 10 Bonds to 10 3-D shapes Spatial awareness Patterns. Consolidate learning so far.	To 20 and beyond Build numbers beyond 10 Count patterns beyond 10 Spatial reasoning Match, rotate, manipulate.	Find my pattern Doubling Sharing & grouping Even & odd Spatial reasoning advanced Visualise and build.
	Just like me! Match and sort Compare amounts Compare size, mass & capacity Exploring pattern.	Light & dark Representing numbers to 5 One more or less Shapes with 4 sides Time.	Growing 6, 7, 8 6, 7 & 8 Combining two amounts Making pairs Length & height Time advanced.		First, then, now Adding more Taking away Spatial reasoning 2 Compose and decompose.	On the move Deepening understanding Patterns & relationships Spatial mapping Mapping.

Our Mathematics Overview- Year 1

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Place value (within 10) Recognising numbers/words Groups Use comparison Order values.	Addition and subtraction (within 10) Developing understanding of number while reasoning and solving problems.	Place value (within 20) Understand number value and develop secure counting skills	Place value (within 50) Understand number value and develop secure counting skills.	Multiplication and Division Developing understanding of number while reasoning and solving problems.	Place value (within 100) Understand number value and develop secure counting skills.
		Geometry: Shape Recognise and name common 2D/3D shapes. Reason and problem solve.	Addition and subtraction (within 20) Developing understanding of number while reasoning and solving problems.	Measurement: Length and Height Comparing and measuring length and height.	Fractions Building on number knowledge. Understanding about half and quarter.	Measurement: Money Recognising amounts and applying counting.
				Measurement: Mass and Volume Comparing and measuring mass and volume.	Geometry: Position and Direction Exploring vocabulary and experimenting with position and direction.	Measurement: Time Understanding about days, weeks, months and years. Understanding about different durations and displaying on clock faces.

Our Mathematics Overview- Year 2

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	Place value Recognising numbers/words Groups Use comparison Order values Work within 100.	Addition and Subtraction Developing understanding of number while reasoning and solving problems	Measurement: Money Count and calculate with money. Reason and problem solve.	Measurement: Length and Height Measure in centimetres and metres. Explore number and length/height.	Number: Fractions Explore unit and non-unit fractions. Reason and problem solve.	Statistics Read and interpret diagrams, charts and graphs.
	Addition and Subtraction Developing understanding of number while reasoning and solving problems.	Geometry: Shape Reason and problem solve. Explore	Multiplication and Division Make links between times tables and division. Reason and problem solve.	Measurement: Mass, Capacity and Temperature Measure in grams and kilograms. Reason and problem solve.	Measurement: Time Explore time to the nearest 5 minutes.	Geometry: Position and Direction Understand vocabulary and apply it practically and with shapes.
						Consolidate learning.

Our Mathematics Overview- Year 3

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Place value Recognising numbers/words Groups Use comparison Order values Work within 1000.	Multiplication and Division Make links between times tables and division. Reason and problem solve. Grow understanding of times tables.	Multiplication and Division Make links between times tables and division including exchanging. Reason and problem solve.	Fractions Understand, count and compare unit and non-unit fractions. Understand more about equivalency.	Fractions Add and subtract fractions. Reason and problem solve.	Measurement: Time Understand Roman numerals. Recap and tell the time to the nearest 5 minutes and 1 minute. Understand about duration.
	Addition and Subtraction Developing understanding of number while reasoning and solving problems. Work across hundreds.		Measurement: Length and Perimeter Measure and calculate in centimetres and millimetres.	Measurement: Mass and Capacity Understand equivalent masses. Measure and calculate volume in litres and millilitres.	Measurement: Money Add and subtract pounds and pence. Convert pounds and pence.	Geometry: Shape Understand about right-angles. Draw and compare right-angles accurately.
						Statistics Draw and interpret a variety of charts and graphs. Represent data.

Our Mathematics Overview- Year 4

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	Place value Recognising numbers/words Groups Use comparison Order values Work within towards 10,000.	Measurement: Area Understand and measure area. Compare different areas and problem solve.	Multiplication and Division Make links between times tables and division including fact pairs. Reason and problem solve.	Fractions Understand, count and compare unit and non-unit fractions. Understand more about improper fractions.	Decimals Partition, compare and order decimals. Problem solve and reason.	Geometry: Shape Understand about complex angles, quadrilaterals, polygons and lines of symmetry.
	Addition and Subtraction Developing understanding of number while reasoning and solving problems. Work across 1000.	Multiplication and Division Make links between times tables and division. Reason and problem solve. Master understanding of times tables.	Measurement: Length and Perimeter Measure and calculate in centimetres and millimetres. Use different shapes and grids.	Decimals Understand tenths and hundredths on a place chart. Divide digits.	Measurement: Money Convert pounds and pence. Estimate while using money. Develop decimal knowledge.	Statistics Interpret charts. Use comparison, sum and difference.
					Measurement: Time Convert between analogue and digital time.	Geometry: Position and Direction Describe position using co-ordinates. Translate shapes on a grid.

Our Mathematics Overview- Year 5

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	Place value Recognising numbers/words Groups Use comparison Order values Work within towards 10,000, 100,000 and 1,000,000.	Multiplication and Division Understand multiples, factors, prime numbers, square numbers and cube numbers. Multiply and divide by 10, 100 and 1000.	Multiplication and Division Make links between times tables and division including exchanging. Reason and problem solve.	Decimals and Percentages Make links between decimals and percentages. Reason and problem solve.	Geometry: Shape Understand and use degrees. Classify, estimate and calculate angles. Reason and problem solve.	Number: Negative numbers Understand, count, compare and order negative numbers.
	Addition and Subtraction Developing understanding of number while reasoning and solving problems. Develop understanding of multi-step problems and using the inverse.	Fractions Understand, count and compare unit and non-unit fractions. Understand more about equivalency.	Fractions Multiply fractions including mixed fractions.	Measurement: Perimeter and Area Deepen knowledge of perimeter and area.	Geometry: Position and Direction Read and plot co-ordinates. Use knowledge of co-ordinates while translating. Find lines of symmetry in complex shapes. Complete a reflection on horizontal and vertical lines.	Measurement: Converting units Convert units of length, mass and time.
				Statistics Draw, read and interpret line graphs, tables, two-way tables and timetables.	Decimals Add, subtract, multiply and divide decimals. Reason and problem solve.	Measurement: Volume Understand cubic centimetres. Compare, estimate and calculate.

Our Mathematics Overview- Year 6

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6	Place value Mastering number concepts with all four operations. Learn and calculate to the power of 10. Compare, round and order integers.	Fractions Add and subtract mixed numbers. Solve multi-step problems. Multiply and divide fractions.	Ratio Understand ratio and the language used to calculate. Use scale drawing and scale factors. Solve ratio and proportion problems.	Fractions, Decimals and Percentages Master, reason and problem solve with fractions, decimals and percentages.	Geometry: Shape Measure, classify and calculate angles in shapes, different triangles, quadrilaterals, polygons and circles. Understand nets of 3-D shapes.	Consolidation, themed maths projects and problem solving (including logic problems)
	Addition, Subtraction, Multiplication and Division Mastering number concepts with all four operations. Reason and problem solve. Understand and master factors, multiples, cube numbers, long division and estimation.	Measurement: Converting units Convert and calculate metric measures. Understand and calculate imperial measures.	Algebra Understand what algebra is and solve 1 and 2 step function machines. Form expressions and formulae. Solve and reason.	Measurement: Area, Perimeter and Volume Master, reason and problem solve with area, perimeter and volume.	Geometry: Position and Direction Understand quadrants. Read and plot points within four quadrants. Solve problems with co-ordinates. Master translation and reflection.	
			Decimals Master decimals. Round, add, subtract, multiply and divide.	Statistics Draw, read and interpret graphs and tables including pie charts.		

Progression of Mathematical Language- EYFS- Year 6

Number: Number and Place Value

Number: Number and Place Value							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
number	subitise	numeral	count in steps	ascending	negative numbers	ten thousands	million/s
count	order/ordinal	represent	count in multiples	descending	roman numerals	one hundred thousands	ten millions
none	forwards	multiples	value	hundred/s	thousand/s	powers of	
nothing	backwards	partitioning	place value	10 or 100 less/more	round/ing	integer	
zero	one more	ones	estimate		1000 less		
	one less	tens	compare		1000 more		
	more than	equal to	amount				
	less than (fewer)	sort					
		digit					
		compare					

Addition and Subtraction

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
join	add	addition/add	sum	column addition	4-digit number	boundary	order of operations
put together	plus	subtraction	3-digit number	column subtraction	operations	rule	formula
left	altogether	difference	commutative	exchange	methods		equation
make	total	equals	inverse	estimating			
gone	take away /minus	facts					
	number bonds	problems					
	part	missing number					
	whole	2-digit number					
	left over	minus					
	pattern	model					

Multiplication and Division

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
share	double	repeated addition	commutative	factor pairs	multiples	division	multi-digit numbers
again	equal	multiplication	tables	remainder	factors		long division
	unequal	division	related facts		product		
	odd	arrays	section		dividend		
	even	repeated subtraction			divisor		
	twice as many				quotient		
	pattern						

Fractions/ Decimals/ Percentages

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
part	whole	half	three quarters	tenths	decimal	fifth	reduced to
		quarter	third	numerator	hundredths	thousandth	cancel
		equal parts	equivalent fractions	denominator		mixed numbers	
			unit fractions	section		per cent %	
			non unit fractions			factors	
			one whole			integer	

Ratio and Proportion

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
number	sort	equal	quantity	multiplication	missing values	relative size	integer
	pattern		unequal		product	scale	factor unequal
						term	sharing & grouping

Algebra

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
number	groups	grouping	sequences	equation	combinations	formulae	algebraically
			operation			unknowns	variables

Measurement: Length and Width

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
tall	measure	length	standard units	millimetre mm	kilometres km	decimal notation	conversion	
small	long(er)(est)	width	estimate	perimeter	rectilinear figure	scaling	miles	
little	short(er)(est)	compare	order	non-standard	area	metric units	parallelograms	
long		narrow(er)	results			imperial units	formulae	
short		wide(er)	centimetre cm			inches	feet	
			metre m				compound shape	
							irregular shapes	
							square centimetres	
							square metres	

Measurement: Height, Weight and Capacity

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
big	height	mass	kilogram kg	enough	roughly	cubic centimetre	cubic metre
bigger	heavy/light	volume	gram g	not enough	approximate	pounds	cubic millimetre
tiny	heavier	weight	quarter full	over	approximately	pints	cubic kilometre
small	lighter	capacity	three quarters full	under			gallons
	full/empty	half/half full	litres l				stones
	more	measure	millilitres ml				ounces
	less		temperature				
			Celsius				

Measurement: Time/ Durations of Time

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6		
day	hands	o'clock	digital	intervals of time	convert	usually	momentarily		
night	face	month	analogue clock	Roman numerals	always	sometimes	biennial		
time	numbers	year	duration	12-hour clock	arrive	Greenwich Mean Time	bicentennial		
clock	before	midnight	quarter past/to	24-hour clock	depart	millisecond	per annum		
today	after	half past	second	a.m./p.m.	millennium	period	punctual		
next	first	hour	noon	leap year	pause	anniversary	timetable		
start	yesterday	minute/s	midday	century	delay		nanosecond		
finish	tomorrow	calendar	fortnight	belated	zone				
	morning	past	future	annual	Time zone				
	afternoon	present	chronology	dial	decade				
	evening		cycle						
	moment								
	soon								

Measurement: Money

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
money	cash	value	change	exchange	budget	balance	expense
buy	coins	pounds £	sum	payment	discount	income	profit
	bought	pence p	worth		sale		
	pay	notes	amount				
	sell	spend	spent				
		total	cheap				
		price					
		cost					
		sold					

Geometry

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
line	point	equal	centre	angle	degree	proportion	ratio
			unequal	equivalent	midpoint	sector	slope
			symmetry		parallel		surface area
					area		
					perimeter		

Geometry: Properties of shapes

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
shape	2-D shapes	sides	pentagon	right-angle triangle	isosceles	regular polygon	radius
flat	rectangle	corners	hexagon	polygon	equilateral	irregular polygon	diameter
	square	properties	line of symmetry	prism	scalene		circumference
	circle	pyramids	properties	characteristics	trapezium		dimensions
	triangle	faces	cylinder	orientation	perpendicular		arc
	3-D shapes	cone	edges		rhombus		
	cuboid	sphere	vertices		parallelogram		
	cube	curved	vertex		geometric shapes		
	sort	straight	heptagon		quadrilaterals		
		solid	octagon				
			properties				

Position and Direction

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
over	movement	position	straight line	clockwise/ anti-clockwise	co-ordinates	reflection	second, third, & fourth quadrants
under	order	direction	rotation	arrange	first quadrant	mirror line	co-ordinate plane
on	repeat	whole turn	sequences	vertical	grid		
around	patterns	half turn	quarter turn	horizontal	translation		
behind	on top of		three-quarter turn		plot		
into	through				polygon		
next to	beneath				axis		
	between						

Statistics

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
set	sorting	pictograms	table	interpret	time graph	two-way tables	pie chart
	group	tally chart	bar chart	category	line graph	difference problem	mean
	block	block diagram	one-step problem	two-step problem	sum problem	continuous data	
			totalling	data	calculate	discrete data	
			comparing		horizontal		
					vertical		

Spiritual, Moral, Social and Cultural Development in Mathematics

In our Maths lessons at Parkside Primary School pupils are encouraged to delve deeply into their understanding of Mathematics and how it relates to the world around them. Our Maths teaching actively encourages risk taking which enables pupils to explore and try new ideas without the fear of failure. This is fundamental to building pupils' self-esteem within Mathematics. Throughout history, the study of Mathematics stems from intrigue and curiosity, with people's desire to pose and solve problems relating to the real world or purely within mathematics itself. We aim for our students to appreciate this and use their own Maths to explore and question the way the world works and also to apply their reasoning to puzzles for their personal satisfaction.

Spiritual development

- Developing deep thinking and questioning the way in which the world works promotes the spiritual growth of our students.
- We are sensitive to students' individual needs and backgrounds and experience.
- We aim to give all students an appreciation of the richness and power of maths.
- Maths in Nature is embedded in Sequences, Patterns and Symmetry.
- We promote a sense of wonder in the exactness of mathematics in the exploration of complex numbers and real world examples.
- We encourage the students to appreciate the enormity of the world of Mathematics as it has developed through time.
- We consider the development of pattern in different cultures including work on tessellations such as using Rangoli designs or the use of religious symbols for symmetry.

Moral development

- Within the classroom, we encourage respect, reward good behaviour. We value listening to others views and opinions on problem solving.
- We promote discussion about mathematical understanding and challenge assumptions, supporting students to question information and data that they are presented with.
- We show the students that we are on a quest for truth by rigorous and logical argument and discourage jumping to conclusions.

Social development

- In classrooms, we look for opportunities for pupils to use interactive resources (e.g. mini whiteboards, number fans, mini counting sticks) to promote self-esteem and build self confidence.
- We are a collaborative learning school. Children routinely listen and learn from each other. Group leaders encourage their tables to support each other.
- We help pupils develop their mathematical voice and powers of logic, reasoning and explanation by offering explanations to each other. Again, this is a regular component of every maths lesson.

Cultural development

- We share the appreciation with the pupils that mathematics, its language and symbols have developed from many different cultures around the world: eg Egyptian and Roman and Maya.
- They also explore mathematics applied in the Arts, such as Rangoli patterns, Tudor rose windows, tessellations and Islamic geometric patterns.
- Children are encouraged to see the links between number and music notation.

Essential Characteristics Endpoint of a Learner in Mathematics- EYFS

By the end of Reception every child will be able to:

- Enjoy and play with maths learning.
- Work with concrete materials and familiar ideas.
- Explore number patterns and relationships.
- Investigate the realistic uses of number in their everyday world.
- Describe, explain and ask questions.
- Count objects, actions and sounds.
- Subitise a group of objects.
- Link the number symbol (numeral) with its number value.
- Count beyond ten.
- Compare numbers.
- Understand the 'one more than/one less than' relationship between consecutive numbers.
- Compose and recompose different arrangements and representations of number.
- Describe and manipulate shapes, discussing patterns and differences.
- Continue, copy and create repeating patterns (numbers and shapes).
- Compare length, weight and capacity.

Essential Characteristics Endpoint of a Learner in Mathematics

The intent of the Mathematics curriculum at Parkside Primary School is to provide every pupil with:

- An understanding of the important concepts and an ability to make connections within mathematics.
- A broad range of skills in using and applying mathematics.
- Fluent knowledge and recall of number facts and the number system.
- The ability to show initiative in solving problems in a wide range of contexts, including the new or unusual.
- The ability to think independently and to persevere when faced with challenges, showing a confidence of success.
- The ability to embrace the value of learning from mistakes and false starts.
- The ability to reason, generalise and make sense of solutions.
- Fluency in performing written and mental calculations and mathematical techniques.
- A wide range of mathematical vocabulary – used accurately and with precision.
- A commitment to and passion for the subject.