

Calculation Policy

This policy provides information on the methods, skills and concepts we teach the children in order to solve problems in the four operations. It is regularly reviewed through professional discussion from teachers.

Mathematics Intent

Our maths curriculum aims to equip pupils with the knowledge, understanding, skills and methods needed to solve mathematical problems, help them understand the importance of maths in the world; develop their ability to reason mathematically and to nurture a sense of enjoyment and curiosity in the subject.

Through varied and frequent practice with increasingly complex problems over time, our curriculum supports pupils to become fluent in the fundamentals of mathematics, number sense, place value and the four operations, and allows pupils to make clear connections across the subject. This enables pupils to develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

Version Control

Version	Date	Changes made / Comments	Changes made by
1	March 2020	Original Policy	n/a
2	November 2022	More information for each section	Josh Twyford
	November 2022	Monitor and review section added Approved at Curriculum meeting 14.11.22 and circulated to all staff	Stephanie Croucher

	Reception -	Addition	
Objective	Concrete	Pictorial	Abstract
1:1 Correspondence, stable order and cardinality	Children are taught how to count accuratley a throughout the year and form the basis for m count and explore number.	and that the final amount counted is the nore advanced learning. Children use a v	e total. These skills are embeded variety of resources and pictures to
Before teaching addition in Reception we subitise 1-6 and ask the children to show amounts using their fingers on two hands. We teach the children simple addition facts using subitising and finger discrimination. In the Summer term we begin to conceptually subitise using dice faces and Hungarian 10s frames.	children use different size dice in their free play and are encouraged to subitise and explain 'how they know that it is 2?' "Because 2+2=4" Children have access to two sided counters and are challenged to create patterns that they can subitise.	representations of amounts using 10 frames, dice faces, hands etc. Hungarian 10 frames are used with two sided counters and children are	an amount they can subitise.
Understand the one more and one less relationship between consecutive numbers	Children are taught to take 1 more and 1 away from a group objects. We teach the children to count them to check or subitise if they can then say it as a sentence and/or an equation, "1 more than 4 is 5" 4+1=5.	Children create their own number lines to build their understanding of stable order principle. We teach the children how to find 1 more and 1 less using a number line.	If the children are ready we will teach them how to interpret and begin to write 1 more and 1 less problems as equations. 6+1=7 7-1=6

Solve addition problems up to 10. -Fingers -Counting all objects -First, then, now stories -Numberlines -Manipulatives (numicon, cubes, counters, bead strings, rekenreks) -10 frames -Counting on -Adding over 10 using 10 frames and beginning to

When the children are ready we will teach them how to count on rather than count all. They keep the greater number in their head then count on the amount of the second number. This is supported by the methods above.

make a 10

Children are taught to combine two groups and count them all to find the total. A variety of manipulatives are used. Whole part models are used to highlight the

parts becoming a whole and develop children's understanding of the parts of an equation equallying a total.



Children are taught to add using bead strings and rekenreks, beginning with oral problems (I have 4 cakes, then get 3 more, how many cakes do I have now?). Children are taught to

create the first amount, add on the second then count the total.

and the Parameter of the Parameter



Children are taught the plus symbol and solve problems using pictorial representations.



Children solve addition problems using pictorial representations of 10s frames. They are taught to interpret the equation and corresponding image and check it is correct.



Children are taught how to interpret simple addition equations and solve them.

Children regularly take part in recall sessions using number bonds and mental recall is encouraged when solving number bond addition problems.

Whole part part models are used to highlight the two parts becoming one.



6+3=9

Calculation Policy – Version 2 – November 2022

Children use first, then, now stories alongside concretes so they can physically see the process of adding amounts together.



Children create their own number lines. They are taught to add two amounts using a numberline by finding the first amount or creating it with cubes, jumping forward the second amount and landing on their anwer.



Children are taught to add numbers that go over 10 using 10 frames and numicon so they can begin to create a 10.

Having used cubes to support the number line, children are taught how to use a number line without



manipulatives. They find the first amount, count on the second and land on the answer.



	Year 1 - Addition					
In Year 1 children	build on the strategies taught in Reception. Th	ey also learn the	e strategies below. Mental n	nethods are encouraged if the	children are	
Objective	Concrete	Pictorial		Abstract		
Combining 2 parts to make a whole Use a variety of resources e.g. shells, teddy bears, cars. Part-whole models	Base 10 resources are introduced (10s and 1s) and children are taught how to add amounts of them together. Children are taught to count 10s first and ensure they do not count the 1s as 10 and vice versa.	₽₽ ₽₽	Use pictures to add two numbers together as a group or in a bar.	4+3=7 Four is a part, 3 is a part and the whole is seven. 7 4 3 number equations. 5 + =	Children use whole part models to find missing parts/the total. These are linked to missing 12	



Regrouping to make 10 Using a ten frames and counters/cubes or numicon.	Children begin to explore converting using base 10 resources. They focus on developing their place value knowledge in order to recognise when an equation goes over a 10.	Children to draw the tens frames and counters/cubes	$6 + \Box = 11$ $6 + 5 = 5 + \Box$ $6 + 5 = \Box + 4$ Children regularly review and revise number facts, especially number bonds for amounts to 10. They are taught to move the equation round using what they know. They are taught that the = can move.
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Vers 2. Addition				
		real 2 - Addition		
Children in Ye	ar 2 continue to refine the methods taught in R	Reception and Year 1. They use the same mode	ls and visuals (whole part, bar models, lines	
and dots, 10 fra	ames, Hungarian 10s frames). Teachers focus or	n ensuring the children are using the most effic	ient methods, with more emphasis being put	
on men	ital maths if possible. During the Summer term,	, if they are ready, the children begin to learn c	olumn method to prepare for Year 3.	
Objective	Concrete	Pictorial	Abstract	
Adding 3	4+7+6=17			
single digits	Using concretes such as cubes, numicon etc.		(4) + 7 + 6 = 10 + 7	
	Find 10 by adding 4 + 6 = 10 then add 7. Find 10 by adding 4 + 6 = 10 then add 7.			
	= 17			
Combine the two that make 10 and				
		Add together three groups of objects. Draw a picture to recombine the groups to make 10.	on the remainder.	

Use of base 10 to combine two numbers Two digit + 1 digit	41+8	Children are taught to use lines and dots to draw and represent amounts. They are encouraged to mentally visualise the amount as 10s and 1s.	41+8 $1+8=9$ $40+9=49$ 40
Use of base 10 to combine two numbers Two digit + 2 digit	Children are taught to add using 10s and 1s. They are taught to add the 10s first but if they find the other way round more efficient they are not made to change.	Children represent the base 10 in a place value chart with lines and dots as before.	21 + 42 $20 + 40 = 60$ $2+1=3$ $60+3=63$ Children are taught to use their knowledge of place value to break down an equation, then add the 10s/1s.



	Reception – Subtraction					
Children are introduced to	o subtraction as the opposite of addition. In	Reception the children use a variety of cor	cretes to physically take items away,			
highlighting how to total i	highlighting how to total is decreasing.					
Objective	Concrete	Pictorial	Abstract			
Taking away ones	Physically taking away and away and removing objects from a whole (ten frames, Numicon, cubes and other items	Children will use drawings to visualise the equation then cross out to represent subtraction.	Children are introduced to the – symbol and shown simple equations. They are linked to known number facts and decomposition of numbers to 10.			
Counting back	Light number lines or number tracks	Children to represent what they see				
Counting back	Using number lines or number tracks	nictorially e.g.				
	back 2.					
	6 - 2 = 4 1 2 3 4 5 6 7 8 9 10	12345678910				

Part whole model	Link to addition- us the part whole mod to help explain the inverse between addition and subtraction.	Use a pictorial representation of objects to show the part whole model.		
Making 10	10 - 6 =	This chiestive is only tought using		
Using a ten frame Children are taught to find a 10 by subtracting an amount.		ready to use a pictorial 10 frame where they draw their own pictures to represent amounts.		
	Y	ear 1 - Subtraction		
Children in Year 1 continue to develop their understanding and skills when using base 10 resources, number lines, 10s frames and bead strings. They use whole part models and bar models to find missing numbers and use lines and dots to solve subtraction equations and problems. Children use their mental maths where possible and count backwards.				
Objective	Concrete	Pictorial	Abstract	

Taking away ones Taking objects away, crossing pictures out, counting backwards, fingers.	Creating a total then using manipulatives to physically take away and remove objects from a whole (ten frames, Numicon, cubes and other items should be used).	Children draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.	4-3=
		Children taught Ines and dots to represent 10s and 1s. They cross these out to show the amount subtracted.	
Counting back	Using number lines or number tracks children, children start with 6 and count back 2.	Children to represent what they see pictorially e.g.	Children to represent the calculation on a number line or number track and show the jumps. Encourage children to use an empty number line.

		12345678910	
Find the difference Using cubes, Numicon and other objects	Calculate the difference between 8 and 5.	Children to draw the cubes/concrete objects that they have used. Use the bar model to illustrate what they need to calculate.	Find the difference between 8 and 5. 8 – 5, the difference is ? Hannah has 23 sandwiches. Helen has 15 sandwiches. Find the difference between the number of sandwiches.



	Year 2 - Subtraction					
In Year 2 childre	n are enco	ouraged to use the most efficient method. They use lir	nes and dots to visualise base 10 reco	ourses and cross out the amount being		
subtracted. Whe	en ready c	hildren are taught to convert 1s into 10s in order to m	ake the equation easier to do.			
Objective		Concrete	Pictorial	Abstract		
Use of base 10		Use base 10 resources to physically take items	Children to represent the base 10	Children are taught to count		
2 digit subtract 1	digit	away.	pictorially.	backwards in 1s and 10s or vice		
and 2 digit subtr	act 2	And a support of the		versa.		
digit without an exchange.		36-14-122 T U T U 30 6 30 6 - 10 4 20 2	10s 1s ;???	48-7=41		
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	4 1	8-7=1		
Use of base 10		41 - 26 Children	Represent the base 10 pictorially,	Subtract either the 10s or 1s first		
With an exchang	ge	10s 1s 10s 1s are taught	remembering to show the	then the other.		
			exchange.	Break the 43-10-20		
			10s 1s	number down		
		equations	1+ +Q .	and count 40-0-00		
		of 1s and teach the shildren how to convert 10.1s	- ::555	bridging 10 38-10=28		
		into a 10	1 5			
		Reception – M	ultiplication			
In Reception chil	dren use	concrete objects to explore equal and non-equal grou	ps. We teach the children how to ide	entify equal groups by moving objects		
and making fami	iliar patte	rns. The children manipulate objects and move them t	o create equal groups from larger ar	nounts.		
Objective Concrete				Pictorial		
Recognising	There are	e 4 equal groups with 2 in each group. 2,4,6,8	Children to represent the pr	actical		
and making		There are 8 altogether	resources in a picture.	00 00 00		
equal groups.			Counting in 2's, 5's and 10's	00 00 00		
Only in 2's, 5's				and the second		
and 10's.						



Recognising and making equal groups.	There are 3 equal groups, with 4 in each group.	Children to represent the practical resources in a picture. Children are taught what arrays are and how they can be made.	4+4+4=12
Doubling	Use practical activites to show how to double a number.	Double 4 is 8 Draw pictures to show how to double a number.	Learn double facts and record as equations. 4+4=8 3+3=6

Counting in multiples. Use cubes, Numicon and other objects in the classroom.	Count in multiples supported by concrete objects in equal groups. Children use counters and cubes to make arrays. These are also linked to numicon to show groups of the same amount.	Use a number line or pictures to continue support when counting in multiples.	Count multiples of a number aloud. Write sequences with multiples of numbers. 2,4,6,8.10 5,10,15,20,25



Sharing objects into groups.	Sharing using a range of objects.	Represent the sharing pictorially.				
Division as grouping	Divide quantities into equal groups. Use cubes, counters and other objects.	This objective is only taught using concrete manipulatives unless pupils are ready.				
Division-Year 1						
In Year 1 children continue to share using concretes. Children are taught the circle and dot method. They are introduced to the division symbol and record and solve division equations using objects, lines and dots and counting in multiples when ready.						

Sharing objects into groups.		\odot \odot	3 3			
	Sharing using a range of objects	Children use nistorials to represent equal	Children use bar models to show equal groups of a number.			
		groups. They are taught how to use circles and dots to solve division problems.	divison equations.			
Division as grouping		0 1 2 3 4 5 6 7 8 9 10 11 12	I have 12 toys and I put them into groups of 3. How many groups? 6÷2=			
	Divide quantities into equal groups. Use cubes, counters and other objects.	Teachers use a number line to highlight equal groups.	Children who are ready are taught to count in multiples, lifting a finger each time they say a multiple.			
Division-Year 2						
In Year 2 children continue to refine their methods of solving division problems and equations. Circles and dots continue to be taught alongside counting in multiples. Children learn how to solve division problems that involve remainders using concretes such as sticks/cubes.						

Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. 1000000000000000000000000000000000000	Use a number line to show jumps in groups. 0 1 2 3 4 5 6 7 8 9 10 11 12 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	28÷7=4 Divide 28 into 7 equal groups. How many are in each group?
Division linked to arrays Counting in multiples	Link division to multiplication by creating an array and thinking about the number sentences that can be created. E.g. 15÷3=5, 15÷5=3, 5x3=15, 3x5=15	Draw an array and use it to make multiplication and division equations.	Find the inverse of multiplication and division sentences by creating 4 linking number sentences. 2x5=10 5x2=10 10÷5=2 10÷2=5 Children are taught to use their multiplication knowledge and count in multiples to solve division problems/equations.



Monitoring and review

This policy is monitored by the governing body, and will be reviewed in three years, or earlier if necessary.

Signed:_____

Date:_____

Print Name:_____