Northampton Primary Academy Trust Reception – Mathematics



"Small Numbers, Big Ideas"

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.

EYFS Programme of Study – Statutory Framework for EYFS 2021

Daily Opportunities to Develop Number:

- Calendar / Time / Sequencing: Days of the week, Number of days in a month, months, in the year, ordinal language (first, then and next)
- How many children are present/ absent? (whole class/part class)
- Birthdays
- Add a number whenever possible in instructions "please can you pass me 2 pencils?"
- Tidying up: Label pots with an appropriate number e.g. 5 pairs of scissors, then extend up to 10 when appropriate
- Lining up counting the class
- Counting down to the carpet or the end of a task
- Daily story/picture book: some days read it as a mathematician and explicitly tell them this e.g. how many ducks in the ponds, time sequences, ordinal positioning what maths can we see?

End of Year Early Learning Goals:

Number:

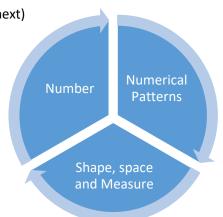
- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns:

- Verbally count beyond 20, recognising the pattern of the counting system
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally

Please note – No Early Learning Goal for Shape, Space and Measure





Possible
Lines of
Enquiry/
Continuous
Provision
Throughout
the Year

N: Nursery rhymes/ number songs/ number books, picture books, Dice Games, Dominoes, Numicon exploration, Counting things that cannot be moved, Counting things of different sizes, Counting of things that cannot be seen, numicon in continuous provision (printing, playdough, in sand, in water, rubbing), feely bags, matching tasks, sharing 'labelling' errors to correct, prediction tasks

Number blocks: See overview for chapters to use and supporting PowerPoints **Number Sense Maths: NP:** See overview for daily number facts long term map

Maths through stories website: https://www.mathsthroughstories.org/recommendations.html

NP: Natural resources to create patterns with, forest schools, peg boards, Lego, construction, shapes, sharing sequence errors to fix, role play, digit cards and number tracks in continuous provision, beebots

SSM: Nursery rhymes, picture books, story books, jigsaw, post boxes, printing, circuits e.g., complete train tracks, construction, puzzles, magnet shapers, hammer boards, shape games e.g., what is in the bag?, solving a design problem for a character e.g. Nursery rhymes/ number songs/ number books, picture books, making pictures with found materials as well as structured shapes and blocks, scales and measuring equipment to explore for a given purpose (linked to a theme), role play, junk modelling, tangrams, magnets, maps, treasure hunts, plans, beebots, remote controlled toys, small world, exploring shapes from various orientations

Spatial Reasoning support and activity ideas: https://queensu.ca.panopto.com/Panopto/Pages/Viewer.aspx?id=ff1b524e-7b5a-4569-bc29-aeca00e95d77

Autumn 1	Knowledge and Skills to be Taught	Vocabulary and Stem Sentences (encourage full sentence responses where appropriate)	Key Representations	Assessment Checkpoints	Year 1 Autumn 1
Number (N)	 Note: Refer to NP and SSM to explore patterns and sorting prior to starting number skills Anything can be counted up to 5 (abstract principle) The same things can be counted in any order (order irrelevance principle) Counting and saying how many up to 5 (cardinal principle) Composition of numbers up to 5: 0, 1, 2, 3, 4, 5 – know that all of the numbers can be made up of 1s Subitising numbers 1- 5 Linking the quantity and the 'label' of the number up to 5 	Number Subitise Digit What do you notice? How many can you see? Can you see? (A number in a real life image) Can you show me the same number on your fingers? I can see a group of I know the number is made up of ones. This shows This does not show	Real life objects 5 Frames Cubes to link and separate Regular dot patterns Irregular dot patterns Photos of real-life objects in a collection to subitise Numicon (Note: Numicon represents a quantity but is one piece and the 'holes' correct amount of parts so introduce this at an appropriate time and model use)	Can count a group of objects up to 5 Can show 1:1 correspondence to 5 Can recognise subitising patterns to 5 (regular patterns)	Place value within 10: Counting forwards and backwards Identify one more and one less and equal to Addition and subtraction within 10: Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs



Numerical Patterns (NP)	 Using shapes and objects: Continue simple patterns e.g. AB, ABB, ABBC on a line Continue simple patterns as stated above on a curved line (Link to SSM) Counting verbally to 5 (Link to N) 	Pattern Sequence Continue My pattern h	nas	Shapes Real life objects Pegs Numicon: staircase	Can recite numbers to 5 Can repeat and make a simple repeating pattern	
Shape, Space and Measure (SSM) (Including Spatial Reasoning)	 Sorting and grouping shapes and explaining their reasoning for the groups and ensure children understand it can be done by a range of attributes Shapes to explore and focus on when learning the number: Circle (1 side) Triangle (3 sides) Quadrilateral: Square and rectangle (4 sides) Pentagon (5 sides) 	is different? I know it is a because it ha	 as sides n to sort my	Shapes Real life objects of various shapes Note: Ensure varied orientations and sizes so not to overgeneralise e.g., triangle properties are three straight sides and one face no matter how it is drawn – it is never an 'upside down triangle' Note: When a shape can be picked up it has 3D dimensions so make sure 2D examples are shown on paper/IWB	Can name taught 2D shapes and beginning to describe properties	



Autumn 2	Knowledge and Skills to be Taught	Vocabulary and Stem Sentences (encourage full sentence responses where appropriate)	Key Representations	Assessment Checkpoints	Year 1 Autumn 2
Number (N)	 1:1 correspondence Fiveness of 5 Comparing quantity Large and small quantities onto requiring counting skills Numbers to 5 using manipulatives to see Number bonds to 5 Explore doubling and halving within 5 Estimation of identifying numbers up to 5 Continue linking the quantity and the 'label' of the number up to 5 Verbally counting to 20 and beyond using a known context e.g. number of children in the class 	Number Subitise Digit Double Half Equal Unequal Number Bonds Compare Larger/smaller More than/less than • What do you notice? • How many can you see? • Can you see? (A number in a real-life image) • This shows • This does not show • Can you show me the same number on your fingers? • I can see a group of • I know the number is made up of • and make	Real life objects 5 Frames Cubes to link and separate Regular dot patterns Irregular dot patterns Numicon Note: Numicon represents a quantity but is one piece and the 'holes' correct amount of parts so introduce this at an appropriate time and model use	Can recognise subitising patterns to 5 (regular and irregular patterns) Can double a given number (0-5) Can explain we can halve an even number to create to equal whole number parts	Place Value within 20: Counting forwards and backwards Identify one more and one less and equal to Addition and Subtraction: Add and subtract one-digit and two-digit numbers to 20 Represent and use number bonds and related subtraction facts within 20
Numerical Patterns (NP)	 Odd and even numbers to 5 Making patterns: AB, ABB, ABBC on a straight line, on a curve, within a square pattern, within a circle 	Pattern Sequence Continue Odd Even My pattern has I know it is an even/odd number because	Numicon Shapes Real life objects	Can explain that some numbers are even and odd Can repeat and make a repeating pattern with more than 2 units	
Shape, Space and Measure (SSM)	 Comparing quantity of objects through spatial awareness e.g., a few large objects taking up more 'space' than lots of small objects Identify 2D shapes that have taught so far on 3D shapes Positional language through a context 	Larger/smaller Corners More Straight than/less than Curved Circle Face Triangle Equal Quadrilateral In	Real life examples of 3D shapes Building blocks in the construction area	Can state which group of objects has more.	2D and 3D shape: Recognise and name common 2-D and 3-D shapes



(Including	Square	On	3D shapes	Can identify groups
Spatial	Rectangle	Under		that are more, less or
Reasoning)	Pentagon	In between		equal
	Cube	Next to		Can state which
	Cuboid	In front of		group of objects has
	Sphere	Down		more.
	Prism	Forwards/backwards		Can say which is
	Cylinder			larger by counting or
	Cone			matching one-to-one
	Sides			
	What is the	same and what is		Can describe the
	different?			location of something
	I know it is a because it			using accurate/
	has sides			appropriate
	I have chosen to sort my shapes			positional language –
	by			on, under, next to

Spring 1	Knowledge and Skills to be Taught	Vocabulary and Stem Sentences (encourage full sentence responses where appropriate)	Key Representations	Assessment Checkpoints	Year 1 Spring 1
Number (N)	 Exploring five and a bit Numbers to 10: Subitising Partitioning Composition Linking the quantity and the 'label' of the number up to 10 Estimation of numbers up to 10 Comparing numbers up to 10 discussing strategies can we 'just look', subitise or do we need to count (ensure some groups are equal) Exploring part/part wholes through objects and understanding that some can be taken apart and some can't Exploring parts and wholes through number linked to composition of number Verbally counting to 20 and beyond 	All number vocabulary from Autumn Term Whole/parts What do you notice? How many can you see? Can you see? Can you show me the same number on your fingers? I can see a group of I know the number is made up of ones. and make I have 5 and more. 5 and make and make is equal to and	Real life objects 5 Frames 10 Frames Cubes to link and separate and to compare for more/less/equal to Regular dot patterns Irregular dot patterns Numicon Dice Part/Part/Whole diagrams to physically move objects on	Can practically represent number bonds to 10. Can recognise 1-10 and can exchange Numicon for correct number of objects. Recognising the pattern of the counting system.	Addition and subtraction within 20: Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations Missing number problems such as 7 =? -9.



Numerical Patterns (NP)	•	Retrieval of Counting forwards and backward to 10	Next Forwards Backwards Sequence Continue One more/one less One more/less than is is one more/less than	Number tracks 1 2 3 4 5 6 7 8 9 10 Note: Number lines are not introduced to Year 1 until Spring/Summer Number beads	Can compare two numbers and say which is the larger.
Shape, Space and Measure (SSM) (Including Spatial Reasoning)	•	Recap known shapes so far Shapes to explore and focus on when learning the number: Hexagon (6 sides) Cotagon (8 sides) Cotagon (8 sides) Further exploration of 2D shapes that the children can find in 3D shapes Measuring length and height: Comparing and ordering through estimation skills and aligning physical objects to compare and then using non-standard objects within 10	All shape vocabulary from Autumn Term Hexagon Heptagon Octagon Length, long. longer, longest, tall, taller, tallest, short, shorter, shortest • What is longer/taller than a (given reference)? • I wonder which will the shortest/longest? • What is the same and what is different? • I know it is a because it has sides.	Real life examples of 3D shapes Building blocks in the construction area 3D shapes Ropes/string etc. to support comparing length Cubes	Can name taught 2D shapes and begin to describe properties Can find something longer or shorter than a reference item Can use the language of measure e.g., longer, shorter, heavier etc.



Spring 2		Knowledge and Skills to be Taught	Vocabulary and Stem Sentences (encourage full sentence responses where appropriate)	Key Representations	Assessment Checkpoints	Year 1 Spring 2
Number (N)	•	Number bonds to 10 Explore addition and understand that when we add we get 'more' (to be taught after one less, one more as stated in NP) Explore adding one and how this has a difference of 1 Explore adding more than one with numbers within 10 Explore doubling and halving within 10 (Double 1, 2, 3, 4, 5 and halve 0-10) Estimation discussions where appropriate Verbally counting to 20 and beyond	All number vocabulary taught so far. What do you notice? How many can you see? Can you show me the same number on your fingers? I can see a group of I know the number is made up of ones. I have 5 and more. I have 5 and make One more than is Mhen we add more to we get Mhen we add make Double is Half of is I have 2 equal groups. I have 2 unequal groups.	Real life objects 10 Frames Numicon Cubes Counters/Double sided counters Number Tracks Rekenreks Dice Dominoes	Can show addition and subtraction and talk about it, explaining their reasoning.	Place Value within 50: Counting forwards and backwards Identify one more and one less and equal to
Numerical Patterns (NP)	•	Odd and even numbers to 10 One more and one less to understand consecutive numbers having a difference of one	Sequence Continue One more/one less Difference Odd/even I know it is an even/odd number because	Numicon Number Tracks	Can predict how many there will be if you add or take away one.	



Space and best shape to And why? E.g., to build a bridge or so far. shapes and SD shapes and Com	Compare, describe
best shapes and	1 1 1 1
Measure roll an object Properties describe their and	and solve practical
(SSM) • Describe the properties of 3D shapes • I have chosen to use a Building blocks in the properties prof	problems.
	Measure and begin to
Spatial Cube, Cuboid, Sphere, Prism, Cone, Cylinder Can show	record lengths and
Reasoning) 3D shapes intentionality in	heights
selecting shapes for a Wei	Weight and Volume:
nurnose such as	Compare, describe
cylinders to roll?	and solve practical
proi	problems.
Can use the language	Measure and begin to
of measure of	record mass, weight
longer, shorter, heavier	and volume
etc.	



Summer 1	Knowledge and Skills to be Taught	Vocabulary and Stem Sentences (encourage full sentence responses where appropriate)	Key Representations	Assessment Checkpoints	Year 1 Summer 1
Number (N)	 Exploring number problems to 10 including addition (Ensure use of graphical representation to represent mathematical thinking rather than modelling written number sentences) Exploring subtraction – recap one less from last term Explore how we can subtract more than one Estimation discussions where appropriate to support number sense and to build concept that the sum will be larger than their starting point Verbally counting to 20 and beyond 	All number vocabulary taught so far. One more than is One less than is is one more than is one less than When we add more to we get and make	10 Frames Part/Part/Whole diagrams to physically move objects on Number tracks Cubes Counters Numicon	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as other quantity. Can apply their mathematical knowledge e.g., of number bonds in mathematical exploration	Fractions: Recognising, find and name ½ and ¼ of an object, shape or quantity
Numerical Patterns (NP)	 Within in 10 explore patterns physically when adding: Even numbers to an even number Even number to an odd number Odd number to an odd number 	 What do you notice? An and an number e.g., an even and an even number make an even number 	Numicon 10 Frames		Multiplication: Counting on 2s, 5 and 10s
Shape, Space and Measure (SSM) (Including Spatial Reasoning)	 Making their own 3D shapes from 2D shapes and describe these using properties Explore relationships within shapes e.g., triangles in a hexagon Understand how to recreate images from someone else's view Build structures by copying pictures e.g. using instruction diagrams to build a castle using blocks Capacity and weight – comparing and measuring using estimation and then exploration with nonstandard units 	All shape vocabulary taught so far. Weight Heavy, heavier Light, lighter Capacity Volume I can make a (shape) from (number) (shape). E.g., I can make a hexagon from 6 triangles. I wonder which will the lightest/heaviest?	Real life examples of 3D shapes Building blocks in the construction area 3D shapes Tangrams Scales Cubes	Can name some 2D and 3D shapes and beginning to describe properties Can use 2D shapes to make other shapes and name accordingly e.g. I used 6 squares to make a cube, or I used 6 triangles to make a hexagon. Can use the language of measure e.g., longer, shorter, heavier etc.	Position and Direction: Describe position, direction and movement e.g., whole, half and quarter and three- quarter turns



Summer 2		Knowledge and Skills to be Taught	Vocabulary and Stem Sentences (encourage full sentence responses where appropriate)	Key Representations	Assessment Checkpoints	Year 1 Summer 2
Number (N)	•	Explore the relationship between addition and subtraction Exploring number problems to 10 including addition and subtraction (Ensure use of graphical representation to represent mathematical thinking rather than modelling written number sentences) Estimation discussions where appropriate to support number sense and to build concept that the sum will be larger/smaller than their starting point depending on the operation they are working on Explore equal distribution of quantities: identifying and making equal quantities Verbally counting to 20 and beyond Sharing: Exploring through physical exploration e.g., the picnic activity with a variety of objects to halve e.g., a liquid, a quantity, a whole (N Link)	All number vocabulary taught so far. How could we draw this problem? Do we need to add or take away? How do you know? is one more than is one less than when we add more to we get and make and make when I add two whole numbers the total gets larger When I take away a whole number the total gets smaller equal groups of	Numicon 10 Frames Part/Part/Whole diagrams Rekenreks Real life objects	Knows one more/less than a given number to 10 Can show conceptual understanding of addition and subtraction by talking about it, explaining/showing their reasoning. (note: children are not required to use +, - and = symbols fluidly until Year 1 (See graphical representation support documentation for guidance)	Place Value to 100 Counting forwards and backwards Identify one more and one less and equal to Division: Distribute items fairly, e.g., put 3 marbles in each bag. Recognise when items are distributed unfairly.
Numerical Patterns (NP)	•	Explore odd and even numbers e.g. children to make patterns of their own. Can they make a pattern where don't repeat the same number? Begin to explore patterns in numbers beyond 20 e.g. what do they notice on a hundred square or on a longer number track? What is the same and what is different? (e.g. with the teen numbers)	Equal groups Unequal groups Pairs odd Even	Real life examples of pairs Numicon 10 Frames Number Tracks		Multiplication: Solve one-step problems involving multiplication and division using concrete objects, pictorial representations and arrays with the support of the teacher



Shape,	•	Time:	Share	Real life objects to share	Can use the language	Time:
Space and		 sequencing of daily events 	Divide		of time e.g., yesterday	Sequence events in
Measure		 early exposure to know a clock tells us the time 	Equal	Cubes	and tomorrow	chronological order
(SSM)		 exploring the sense of size of a minute 	Unequal			using language e.g.,
(Including			Groups	Counters		before, after, next
Spatial			Whole/parts			today and yesterday.
Reasoning)			Before	Variety of clocks		Recognise and use
			After	•		language relating to
			First, then, next			dates
			Today			Tell the time to the
			Tomorrow			hour and half past the
			Tomorrow			hour and draw the
			• was before .			hands on a clock face
						Money:
			Before I I			Recognise and know
			• First, then,			the value of different
			next			denominations of
			A Clock can tell us what			coins and notes
			time of day it is.			

Supporting Documents:

Appendix I: Numberblocks Overview/links – programs and PPTs

Appendix II: Principles of counting

Appendix III: Graphical Representation Support Guidance

Appendix IV: Pattern progression training PPT

