NPAT Pre-school 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**

The One to One Principle	**The Stable Order Principle**	**The Cardinal Principle**	**The Abstraction Principle**	**The Order Irrelevance Principle**
The necessity to count each item in a group only once. We assign a distinct name to each number.	The names of the numbers being said in the correct order. This will not change. Understanding that names of numbers have a correct order – understand that numbers have a progressive value.	Know that the final number said when counting, tells you how many objects are in that group.	The idea that we count everything in the same way no matter what it is Anything can be counted.	The order in which the objects in a group are counted is not important. The number order does not change just because the counting order does.

Daily opportunities for maths:

- There are ___ chn here today. Today is a _____. - Please put these ___ (number) ____ (object) away - Please pass me ____ (number) ____(objects) - Birthdays - Countdown to forthcoming events – advent calendars – could be done as a daily opportunity - Reference to shapes when appropriate - Positional language	- Key times of day, morning, lunchtime, afternoon, home time etc. - Sequence language - 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?

The following concepts are to be taught through a meaningful context e.g. hooked on a story, a celebration and include real life problems linked to the hook to solve. These can be identified on medium term planning.

All adults in the provision are to be clear of the mathematical concepts for that day/week so they can refer to them throughout the provision when appropriate not just through maths inputs.

Discuss mathematical ideas throughout the day, inside and outdoors. Suggestions include:

- "I think Jasmin has got more crackers…"
- supporting children to solve problems using fingers, objects and marks: "There are 4 of you, but there aren't enough chairs…."
- draw children's attention to differences and changes in amounts, such as those in stories like 'The Enormous Turnip'

Within the provision ensure that there are opportunities for retrieval of taught skills to over learn, expose the variation through a slightly different problem or resource being used and where precise praise can be given for independent exploration to consolidate learning.

In the planning stage, identify key questions and opportunities for child led pupil voice. This will support with assessing the child's current understanding, build vocabulary skills, deepen their knowledge further and allow for children to share their reasoning and problem solving approaches.

Resource Suggestions: Real life objects, natural objects, counters, buttons, counters, double sided counters, dice, digit cards, 3D shapes, Cards with 2D shapes drawn on, coins, peg boards, multilink cubes, weighing scales, meter sticks, construction equipment, junk modelling equipment

Possible Lines of Enquiry/ Continuous Provision Throughout the Year	**N:** Games such as hide and seek, Model number line (0-5), Share stories about numbers e.g. The shopping basket, Handa's Hen, Number songs, Counting games, Compare amounts of objects e.g., more or lots, Guided play with number pebbles and counting objects, Board games. More counting games and songs, Numbers in meaningful context More/fewer problems **Maths through stories website:** https://www.mathsthroughstories.org/recommendations.html **NP:** Natural resources to create patterns with, forest schools, peg boards, Lego, construction, shapes, Stripes, dots and patterns on fabric, wallpaper, toys, Recreate pattern e.g., peg boards, Duplo, movement and music stamp, clap, stamp, Matching games e.g., the shopping list game, Sequencing the day, stories or recipes, What comes next? e.g., in routines/ daily routines, Stacking blocks, cups, Duplo, natural resources to make patterns, floor tiles, blocks, shapes, Range of construction resources including Lego, Popoids, mobile etc. **SSM:** Shape walks, Jigsaw puzzles, Shape sorters and puzzles. Finding shapes in the environment. What is in the bag? (shapes), Finding and comparing shapes in the environment, Construction blocks, jigsaw puzzles, Inset and jigsaw puzzles, 2D and 3D shapes, stacking blocks, cups, Duplo, Range of construction resources including Lego, Popoids, mobile etc., Shape sorters, weighing scales, water play, loose parts play, Obstacle course – ways of moving, Climbing and other outside equipment
Key Vocabulary	**Number:** More, less, lots, same, how many, number track, number names **SSM:** Pattern, repeating patterns, pointy, spotty, stripy, first, then, after, before, morning, afternoon, evening, **Pattern:** Small, big, long, wide, more, less, long, short, heavy, light, Faces, sides, edges, corners, straight, curved, Triangle. circle, rectangle, square, cube, On, under, in, up, down

Mathematical Concept	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Autumn 1 Reception Baseline
Number	Numbers up to 3		Numbers up to 5		Experiences of number up to 10		
Number: Step 1	One to one principle up to 3. Teacher modelling an input, children to explore this through continuous provision. Introduce the number names to 3.	Subitising numbers 1, 2 and 3 Throughout this, introduce matching numerals to each number. Teacher to model regular dot patterns, numbers on a finger up to 3. Can you show me in a different way? Recaps one to one principle, recaps cardinal principle – bring in the order irrelevance principle. If I move my dots, have I still got 3? If they are closer together/further apart are they still 3? Then bring in irregular dot patterns (Number sense maths - subitising 1, 2 and 3/Number Blocks – episodes One/Another	Recap numbers up to 3 using order irrelevance and stable order principle- lead into teaching how to count backwards. Is it still a stable order if I count backwards? Yes! Practise ordering numbers 1-3 – are they in the right order?	Cardinal principle – teacher to model how many altogether with up to 5 items – recap 1-3 and then teach 4 and 5.	Recap numbers up to 5 using order irrelevance and stable order principle- lead into teaching how to count backwards. Is it still a stable order if I count backwards? Yes! Practise ordering numbers 1-5 – are they in the right order? Exploration of more and less – include variation of: comparing same objects in groups that are bigger/smaller, comparing same objects in groups that are bigger/smaller, comparing objects that are different in size of object as well as how many, comparing similar sized groups and groups that are very different.		Recite numbers to 5/10 Count with 1:1 correspondence to 5 Understand the last number spoken in a sequence names the quantity for that set Recognise numerals to 5 Recognise dice patterns to 3

		One/Two/Three/One, Two, Three!)				
Number: Step 2	Stable order principle – teacher to model correct order and incorrect order up to 3. Can chn spot when mistakes have been made? Chn need to secure the name of the numbers to 3.	Abstraction principle – teacher to model counting things we can see and things we can't see up to 3 (e.g.: dropping beads in a bar/shaking pots to hear the sounds/comparing sounds in continuous provision/counting movements and jumps)	One to one principle up to 5 – recap numbers 1-3 and then teach 4 and 5. Teacher modelling an input, children to explore this through continuous provision, adults clear that this is a concept to discuss	Subitising numbers 1-5 – recap subitising 1-3 and then teach 4 and 5. Throughout this, introduce matching numerals to each number Teacher to model regular dot patterns, numbers on a finger up to 5. Can you show me in a different way? Recaps one to one principle, recaps cardinal principle – bring in the order irrelevance principle. If I move my dots, have I still got 5? If they are closer together/further apart	Experiences of numbers up to 10 – e.g.: songs, stories, rocket launch, hide and seek, throwing beanbags with a long track alongside it. No formal recording, encourage child led mark making. Continue more and less throughout the term.	

				are they still 5? Then bring in irregular dot patterns (Number sense maths – recap subitising 1, 2 and 3, teach subitiising 1-4 and subitising 1-5/Number Blocks – episodes recap One/Another One/Two/Three/One, Two, Three! Teach Four/Five/Three Little Pigs/ Off we go/ How to count/Stampolines)	
Number: Step 3	Cardinal principle – teacher to model how many altogether with up to 3 items.		Stable order principle – teacher to model correct order and incorrect order up to 5 – recap 1-3 and then teach 4 and 5. Can chn spot when mistakes have been made? Chn need to secure the name of the numbers to 5.	Abstraction principle – teacher to model counting things we can see and things we can't see up to 5 – recap 1-3 and then teach 4 and 5 (e.g.: dropping beads in a bar/shaking pots to hear the sounds/comparing sounds in continuous provision/counting movements and jumps).	Experiences of numbers up to 10 – e.g.: songs, stories, rocket launch, hide and seek, throwing beanbags with a long track alongside it.

No formal recording, encourage child led mark making.

Continue more and less throughout the term. |

Shape, space and measure	Developing Spatial Awareness and Introducing 2d and 3d shapes	Shape Awareness, Identifying Similarities Between Shapes and Describing Properties of Shapes	Developing an Awareness or Relationships Between Shapes	
Shape, space and measure: Step 1	Children need opportunities to move both themselves and objects to see things from different perspectives. Provide opportunities for construction, patterns, pictures and selecting shapes which need rotating and flipping e.g. shape sorters and jigsaws. Vocabulary: in, on, under, up, down, across, in front of, behind, forwards, backwards. Identify real life shapes in the environment.	Children to have the opportunity to construct and create things that represent things in their environment, encouraging them to thing about the appropriateness of the shape they choose. E.g. we need to make a tall tower – should we choose a ball? Why not? How did you make that tower? Why are those blocks good ones? Talk about and explore the properties of 2d and 3d shapes through play and construction including vocabulary – sides, corners, straight, flat, round, pointy, sharp, curve. Ensure a large range of shapes e.g. fat triangles and pointy triangles, thin rectangles and wide rectangles.	Spotting shapes within shape e.g. small triangles and bigger triangles, 2D or 3D faces, using pattern blocks to combining 2 or more shapes to make a new shape. Ask children to predict what would happen if paper is cut or folded or combined with another shape. What shape will we see? What is we put two triangles together? What will happen if we fold this square?	Recognise 2D shapes: • Circle • Triangle • Rectangle • Square
	Measure: Recognising Attributes	Measure: Comparing Amounts	Measure: Showing Awareness of Comparison	
Shape, space and measure: Step 2	Make special attributes to recognise measure for size, length, weight and capacity e.g. long, short, bigger, smaller, light, heavy. These may be over applied e.g. long things are straight, all adults are tall so explore with a variety of contexts.	Continue to make comparisons between size, length, weight and capacity. Can the children find something longer or shorter? Encourage comparison through strategies e.g. placing objects side by side or pouring amounts in containers, how heavy something feels in each hands, scales.	Starting to estimate and predict e.g. which box will the teddy fit in? Ordering objects in order of height, weight or capacity. Solving problems e.g. I would like to move the table outside; do you think it will fit through the door?	

	Start to compare amounts (length, capacity and weight). Adults to model the vocabulary to extend and refine conversations. Vocabulary: heavy, high, tall, long, full rather than just 'big'.	Ensure children are presented with large light things and small, heavy things to prevent over generalisation that big means heavy and small means light. Vocabulary: heavier than, lighter than, holds more/less, taller than, not enough, too much, a lot more.		
Patten	**Identifying and continuing patterns**	**Copying, Extending and creating patterns**	**Spotting an Error or Sequencing of events**	

	Identifying and describing real life patterns around them (including patterns using shapes / rugs / wallpapers / art) – use shape language where appropriate. Include language of: pointy, spotty, blobby, stripy.
	
	Continuing an AB pattern to ensure opportunities to talk about what they see. Continue the pattern one item at a time and verbalise as it builds. What will be next?
		Copy an AB pattern that have several repeats to ensure the pattern is evident. How has the pattern been made?
		Vary the pattern with a variety of features e.g. varying objects, size and orientation.
		
		Creating ABAB patterns or changing a pattern that has been given. Provide a range or objects
		e.g. objects, words, sounds, actions.
		Ensure children can create:
		   • At least three repeats to ensure the pattern is sustained.
		   • Cam make a specified pattern to apply their understanding e.g. can you do a green, yellow pattern?
		   • Their own rule to identify pattern features e.g. I am going to make a big, small pattern.
		   • Their own actions or sounds to help generalise the ideas of patterns e.g. clap, stamp, clap…
			Provide opportunities to spot and correct errors. First with spotting an extra item, then a missing object and then a swapped object.
			Encourage the child to describe the pattern first and then detect the error through tracking the pattern from the start.
			
			The child may know there is something wrong but struggle to identify the error, allow time and attempts to repair the error.
			
			Describe sequence of events (e.g.: first, then, after, before).
			
			Introduce vocabulary – morning, afternoon, evening, night time, early, earlier, later.
				Recognise an AB pattern