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Agreed by: Learning and Achievement Committee

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Signature:



## Mathematics at Highfield Nursery School – May 2023

*'Education is not the learning of facts, but the training of the mind to think.'*

*Albert Einstein*



### Introduction

*'The first few years of a child's life are especially important for mathematics development. Research shows that early mathematical knowledge predicts later reading ability and general education and social progress. Conversely, children who start behind in mathematics tend to stay behind throughout their whole educational journey.'*

National Centre for Excellence in the of Teaching Mathematics

This policy reflects Highfield Nursery School's values and philosophy in relation to the teaching of Mathematics. It sets out a detailed framework which the staff can work within. It gives guidance on planning, teaching and assessment. The policy should be read in conjunction with the Early Years Foundation Stage mathematics educational programme and Development Matters, which sets out developmental progress.

Our aims for the children are:

- To develop a real love of maths and take this love on through their life
- To develop their critical thinking and problem-solving skills
- To be eager to learn new skills needed to become confident learners
- To be confident to tackle problems and persevere with challenges
- To make links and notice patterns in their experiences
- To make predictions, be able to test their ideas and solve problems
- To develop ideas of grouping, sequencing and cause and effect
- To represent their ideas and thoughts using words and using marks

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## How we teach maths

The way young children explore the world involves maths. From an early age, children are making connections. They do this by finding similarities and differences between objects and processes. The adult's job is to support children make sense of their world.

The foundational mathematical knowledge is fundamental to excelling in mathematics. We aim to give children repeated experiences so that they begin a deep understanding of the patterns in maths and the confidence to problem solve and 'have a go.' Children are encouraged to guess and estimate so that they have a positive attitude to maths. They are never told they are wrong and are praised for thinking for themselves, whatever the outcome.

Learning to count is made meaningful by applying it to practical problems throughout the day. Every opportunity that is available is used. For example, counting how many children are present, how many cups are needed on their table at lunch and so on. Finger rhymes are woven throughout our story curriculum so that counting 'one more' and 'one less' is fun and relevant. These rhymes help to make the learning active and aids the teaching of matching their counting words to each object. For example, when we sing '5 currant buns' the children stand up and hold a bun. As the numbers decrease a child sits down to reinforce that counting accurately needs 1-1 correspondence.

Numbers are all around the setting, both indoors and out. Children can see different ways in which they are written as well as see the sequence of numbers.

Opportunities for exploring size and weight is consciously planned into each week, as well as being part of the continuous provision. Adults who are playing alongside children in the sandpit will constantly be using the language of size and weight when the children are digging and making sandcastles. "That looks heavy. . .I wonder which one is heaviest?" Sensory trays and role play areas are always accessible and continually give access to these experiences.

Block play is an important area where children play freely. We discuss their designs in relation to the shapes they use and how they interlock or make patterns. We suggest challenges, such as "how can you make it as tall as you and still make it balance?", so that their constructions become increasingly more complex. We add writing materials to the area for children to plan and design prior to building and to record or enhance their building with early writing.

Direct teaching focuses on skills such as subitising, cardinal number, adding and subtracting, mathematical language (shapes, ordinal number, positional etc.), and shape recognition. Skills such as subitising are repeated in lots of different ways. It is a key skill for children to be able to recognize small amounts of objects through using real objects as well as dice and other games. Adults also demonstrate how to record amounts with marks. For example, tallies or drawing sets where children can make their own mark to record their favourite fruit.

Children are challenged through adult initiated activities or 'in the moment' responses through sustained shared thinking. For example, a child who was making a natural collage. He picked up a chalk and began to draw circles. The supporting adult asked the child if he could find a leaf to fit inside his circle. The child responded by finding a leaf small enough to fit. The child then continued to extend this idea and drew a series of elliptical shapes to match the shape and size of other leaves. The adult provided encouragement and mathematical language.

An adult may use a specific book which has been included in our curriculum, such as 'How big is a million?' or plan a real-world mathematical problem such as beans and seeds that need to be sorted and counted. We take advantage of incidental teachable moments, such as a child bringing in a bag of conkers, to explore mathematical language to describe number, size, shape and texture.

The learning environment and resources provided support the process and the staff constantly review and adapt both indoors and outside, to meet needs.

Parents/carers are a huge part of the process, with staff supporting their understanding of the value of early maths through inductions, stay and play sessions and information sent home, on Tapestry and our website.

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## Adults Role

Children at Highfield deserve adults who:

- Talk...talk often, but also take the time to really listen, using the ShREC approach
- Comment rather than ask questions
- Recognise the importance of everyday activities as valuable maths learning opportunities
- Sing a range of number rhymes and use props to support
- Represent numbers using objects and numerals when singing rhymes
- Provide a range of experiences that involve symbolic play to support abstract thinking
- Model using counting words and a range of correct mathematical language to compare quantities
- Model a range of ways to represent numbers
- Value all marks made during mathematical experiences by all children
- Provide a range of real-life opportunities for children to explore a range of mathematical concepts (e.g weight, capacity, distance and height)
- Model ways to solve real-life problems, 'thinking' out loud to model the process
- Support children to tackle a range of real-life problems, allowing them to make mistakes and use trial and error, valuing the process whilst being there to offer support if needed
- Tap into children's interests in areas of maths such as number, shape and pattern and support them to extend their skills and knowledge
- Support children to widen their interests and access to new mathematical experiences

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### Progression in mathematical development

Children are supported to develop skills in both counting and numeral recognition, as detailed below.

Counting skills progression	Numeral recognition skills progression
<ul style="list-style-type: none"> <li>• Shows some awareness of a change in the quantity of objects as they play and explore</li> <li>• Develops an awareness of number names through their enjoyment of action rhymes and songs that relate to their experience of numbers</li> <li>• Shows some understanding that things exist, even when they are out of sight</li> <li>• Demonstrates they know that things exist even when they can't see them</li> <li>• Says some counting words randomly (not necessarily in context to counting)</li> <li>• Recites some numbers in the correct sequence (not necessarily related to counting objects)</li> <li>• Recites number names in order to 10 (not necessarily related to counting objects)</li> <li>• Says some counting words correctly when counting small groups of objects (up to 3 or 4)</li> <li>• Uses fingers, marks or objects to represent small quantities</li> <li>• Begins to make comparisons between small quantities (using language 'more', 'less')</li> <li>• Counts a set of objects by touching each one as they say a number (up to 3 or 4)</li> <li>• Counts a set of objects accurately but has to recount when asked how many there are in the group altogether</li> <li>• Knows that the last number they say when counting is the total amount in the group, without needing to recount</li> <li>• Recognises the quantity of a small number of objects without needing to count them</li> <li>• Accurately counts things that cannot be moved, touched or seen, or that can't be moved around</li> <li>• Knows when to stop, when counting out a given number of objects from a larger set</li> <li>• Recognises that if a group of objects already counted is rearranged, the total number of objects doesn't change</li> <li>• Recognises that if objects are added or removed from a group, the total number will change</li> <li>• Counts irregular arrangements of objects</li> <li>• Uses objects to find 1 more or 1 less than a number</li> <li>• Knows the number that is 1 more than a number</li> <li>• Knows the number that is 1 less than a number</li> <li>• Estimates how many objects they can see and checks by counting all of them</li> <li>• Finds the total number of items in two groups by counting all of the objects</li> </ul>	<ul style="list-style-type: none"> <li>• Has experienced seeing numbers in a range of practical contexts and on display in the environment</li> <li>• Enjoys exploring number stories and picture books</li> <li>• Has experience of singing number rhymes, using props and numeral cards</li> <li>• Uses numerical language during exploration and play</li> <li>• Shows an interest in representing numbers—using objects, fingers or marks</li> <li>• Uses subitising to know the number of objects or the value of a dice or domino</li> <li>• Recognises some numbers of personal significance</li> <li>• Recognises numerals 1-5</li> <li>• Recognises numerals 6-10</li> <li>• Selects the correct numeral to represent 1-5 objects</li> <li>• Selects the correct numeral to represent 1-1 objects</li> <li>• Sequences numerals 1-5 correctly</li> <li>• Sequences numerals 1-10 correctly</li> <li>• Begins to make marks to correctly represent a quantity</li> <li>• Begins to write numerals to correctly represent a quantity</li> <li>• Writes numerals to correctly represent a quantity</li> </ul>

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**Mathematical vocabulary**

Number	Addition and subtraction	Measure	Length	Height	Width	Depth
Number Zero One, two.... How many? Count Same as More Less Few, fewer	More Add Altogether How many? Put together 1 more How many more? Take away Less How many are left? How many have gone? 1 less	Measure Size Guess Estimate Enough Not enough Too much Too little Too many Too few Nearly Close to About the same as	Length Long Longer than Longest Short Shorter than Shortest	Tall Taller than Tallest Short Shorter than Shortest High Higher than	Wide Wider than Widest Fat Fatter than Fattest Narrow Narrower than Narrowest Thin Thinner than Thinnest Slim Slimmer than Slimmest	Deep Deeper than Deepest Shallow Shallower than Shallowest

Distance	Weight	Capacity and Volume	Time			Speed
Far Far away Further Further than Furthest Near Nearer than Nearest Close Closer than Closest	Weigh Weighs Balance Balances Scales Heavy Heavier than Heaviest Light Lighter than Lightest	Full Fuller than Fullest Nearly full Half full Empty Half empty Nearly empty Holds more than Holds less than More Less	Days of the week Day Week Morning Afternoon Evening Night Bedtime Dinnertime Today Yesterday Tomorrow Before	After Next Last Now Soon Early Late Quick Quicker than Quickest Quickly Slow Slower than	Slowest Slowly Old Older than Oldest New Newer than Newest Takes longer than Takes less time than	Quick Quicker than Quickest Quickly Slow Slower than Slowest Slowly Fast Faster than Fastest

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Shape	Position and Direction		Pattern
Flat	Over	Direction	Symmetrical
Curved	Under	Left	Repeats
Straight	Above	Right	Repeating
Round	Below	Up	
Hollow	Top	Down	
Solid	Bottom	Forwards	
Big	Side	Backward	
Bigger than	On	Sideways	
Biggest	In	Across	
Small	Outside	Close	
Smaller than	Inside	Near	
Smallest	Around	Far	
2D shapes	In front of	Along	
Corner	Behind	Through	
Side	Front	To	
Rectangle	Back	from	
Square	Beside	Towards	
Circle	Next to	Away from	
Triangle	Opposite	Side	
3D shape	Apart	Roll	
Face	Between	Turn	
Edge	Middle	Stretch	
Cube	Edge	Bend	
Cuboid	Corner		
Sphere			
Cone			
Pyramid			

### Maths in daily routines

Staff use daily routines and structure within sessions to model and support a range of basic maths skills - this includes incidental and planned activities. Incidental learning opportunities are utilised during tidy up time, dressing for outdoors and through play experiences e.g. in the home corner, play dough or blocks.

### Group time for registration

- Accurate 1:1 counting and final number recall, number recognition and ordering
- Visual timetable, now/next, schedules and routines:
- Counting the number of children here and those absent-how many altogether in the group?
- Days of the week-what day was it yesterday? today, tomorrow, the weekend
- Time of day and sequence of events/activities-now, next, after

### Learning Environments

All the environments are carefully planned out within the different areas to reflect the children's learning needs with maths skills. The children are observed and through careful assessment the environment reflects these needs and to promote curiosity, involvement and challenge.

As part of our monitoring systems, learning walks take place to evaluate the provision and to ensure there are quality learning opportunities for all children. This is discussed and any adjustments made.

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### **Working with parents/carers**

We value our relationships with parents/carers and know that because of this our children make excellent progress. We have developed systems to share our understanding of maths development and what parents/ carers can do to support children's learning at home.

Parents/carers are introduced to the concept that Maths is everywhere in all daily activities and the process of how young children learn counting skills.

Suggestions of ways to support their child at home are shared.