

Mathematics

Intent

In Early Years we develop fluent mathematicians who have a deep conceptual understanding of number. We ensure that they are able to provide explanations, give reasons for their answers and tackle future challenges by:

- Providing opportunities for children to practise, rehearse and apply mathematical knowledge and skills
- Encouraging children to investigate numbers and shapes by exploring their characteristics and patterns
- Developing knowledge and understanding of the composition of number and shape
- Encouraging them to think logically so that they can make connections and solve problems
- Fostering children's acquisition and use of mathematical vocabulary to justify and explain their ideas



Implementation

Mathematics is valued and promoted through daily direct teaching and (in REY, Magic Maths/bespoke/Word Aware –concepts) (in FS1, Numberblocks, Jack Hartmann, Word Aware – concepts) (in FS2, White Rose/Word Aware – concepts/bespoke Scheme is used) purposeful learning opportunities across all subjects and all areas of provision. During the planning process, careful consideration is given to the next steps in learning. Each area of the provision is equipped with relevant maths resources to enable children to practise and apply their mathematical knowledge and skills. Challenge cards/signs are often added in provision for adult prompts.

- A Maths Base is situated within the provision and outside. It offers a variety of open ended resources that promote a conceptual understanding of number encouraging children to become confident and fluent, sometimes this area may have focussed resources e.g. shapes.
- The resources are thoughtfully organised in baskets so that children can see what and how many are available, access them independently and tidy up time can be optimised as an opportunity to practise and rehearse number skills.
- The environment is enhanced with number lines, hundred squares, mathematical vocabulary and questions to provide children with visual prompts and opportunities to solve problems.
 - Opportunities both indoor and outdoor environments to develop mathematical thinking and use mathematical vocabulary e.g. Large loose parts play, garden kitchen.

Adults appreciate that maths can be taught everywhere and that the conceptual understanding of number is the basis for all other mathematical learning. They have a sound knowledge and deep understanding of mathematical concepts and vocabulary to enable them to teach the necessary foundation skills which children need to become fluent mathematicians. Within the environment adults capitalise on every opportunity to present mathematical problems for children to think about and solve. They support children in practising and applying their mathematical knowledge and skills by encouraging them to talk about their thinking, provide explanations and give reasons for their answers. All EYFS practitioners have undertaken training with Karen Wilding Education, which links with Powers Maths and Maths Mastery.

Skills 2-3 years

- Verbally rote count to 5 and beyond

Numbers

- Count in everyday contexts, sometimes skipping numbers – 1,2,3,5

Number rhymes

Skills 3-4 years

- Verbally rote count to 10 and beyond

Numbers to 5

- Subitise small amounts of up to 3 objects
- Link numeral and quantity up to 5
- Count reliably to 5, and beginning to count beyond 5
- Say one number name for each item in order

Skills 4-5 years

- Verbally count to 20 and beyond
- Count objects, actions and sounds

Numbers to 10

- Subitise numbers to 5, and use subitising skills to begin to identify larger numbers e.g. 5 and 2 is 7

<ul style="list-style-type: none"> • Take part in finger rhymes with numbers • React to changes of amount in a group of up to three items <p>Number patterns</p> <ul style="list-style-type: none"> • Notice patterns and arrange things in patterns <p>Compare quantities</p> <ul style="list-style-type: none"> • Compare sizes, weights etc, using gesture and language e.g. bigger/little/smaller, tall, long, heavy <p>Shape and Space (spatial reasoning)</p> <ul style="list-style-type: none"> • Climb and squeeze themselves into different types of spaces • Build with a range of resources • Complete simple inset puzzles • Begin to recognise some 2D shapes 	<p>1,2,3,4,5</p> <ul style="list-style-type: none"> • Know the last number reached when counting a set of objects tells you how many there are ('cardinal principle') • Show 'finger numbers' up to 5 • Solve real world mathematical problems up to 3 • Experiments with own symbols and marks as well as numerals <p>Number rhymes</p> <ul style="list-style-type: none"> • Explore simple composition of number through rhymes e.g. 5 little monkeys – 2 monkeys on the bed, 3 on the floor • Sing a selection of number rhymes and songs <p>Number Patterns</p> <ul style="list-style-type: none"> • Extend and create simple AB patterns • Spot and explore errors in repeating patterns • Talk about and identify patterns around them e.g. stripes on clothes, designs on rugs • Begin to describe a sequence of events (real or fictional), using words such as first, then, after that, finally e.g. instructions how to plant a sunflower seed or talking about lifecycles <p>Compare quantities</p> <ul style="list-style-type: none"> • Sorts objects by a variety of criteria • Describes similarities and differences • Compares quantities by 'more than', less than' and 'the same' <p>Shape and Space (spatial reasoning)</p> <ul style="list-style-type: none"> • Talk about and explore 2D and 3D shapes, using informal and mathematical language: 'sides', 'corners', 'straight', flat', 'round' • Select shapes appropriately e.g. triangular prism for a roof • Understand and use positional language 	<ul style="list-style-type: none"> • Know 1 more and 1 less. • Recall double facts • Knows number bonds to 10, with rapid recall of numbers to 5 • Know the composition of numbers to 10 and use different examples to show this. • Recognise numerals to 10 • Write numerals to 10 <p>Number rhymes and stories</p> <ul style="list-style-type: none"> • Use number rhymes and stories to explore composition of number and mathematical concepts e.g. 10 green bottles- 5 bottles on the wall, 5 on the floor <p>Number Patterns</p> <ul style="list-style-type: none"> • Explore, continue and create patterns (including AB, ABB and ABBC) • Spot and explore errors in repeating patterns and discuss how to fix them • Odds and evens • Doubles and sharing Use stepping patterns to identify more/ less number patterns <p>Compare quantities</p> <ul style="list-style-type: none"> • More than • Less than • Equal to • Be able to share practically between different groups • Compare length, weight and capacity <p>Shape and Space (spatial reasoning)</p> <ul style="list-style-type: none"> • Select rotate and manipulate shapes e.g. magnetic tiles, tangrams, blocks • Compose and decompose shapes, recognising
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- Make comparisons between objects relating to size, length, weight and capacity
- Describe a familiar route
- Discuss routes and locations e.g. to Barker's Park

that shapes can have other shapes within them, e.g. 2 triangles can make a square

Impact

By the end of Foundation Stage children will be able to:

- Sort and match
- Read and write numbers
- Give reasons for their answers
- Estimate
- Solve problems
- Recall number bonds to 5 and some to 10
- Recall doubles to 10
- Recognise an amount without counting (subitising)
- Recognise an amount in different arrangements
- Identify and talk about number patterns
- Compare quantities
- Add and subtract numbers
- Sequence numbers
- Calculate
- Count
- Partition numbers
- Talk about shape, space and measure using mathematical language

Early Learning Goals

Number

Children at the expected level of development will:

- 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

Children at the expected level of development will:

- 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.

Links to Year One – National Curriculum

Mathematical Vocabulary

To read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at year 1.

Number and Place Value

Counting

To count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.

To identify one more and one less than a given number.

To count in multiples of twos, fives and tens from different multiples to develop their recognition of patterns in the number system, including varied and frequent practice through increasingly complex questions.

To recognise and create repeating patterns with objects and with shapes.

Reading and Writing Numbers

To read and write numbers from 1 to 20 in numerals and words.

To count, read and write numbers to 100 in numerals.

Solve Problems

To practise ordinal numbers and solve simple concrete problems.

Addition and Subtraction

Mental Calculations

To add and subtract one-digit and two-digit numbers to 20, including zero.

To realise the effect of adding or subtracting zero.

Number Bonds

To *memorise*, represent and use number bonds and related subtraction facts within 20.

Written Calculations

To read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs.

Solve Problems

To discuss and solve one-step problems (in familiar practical contexts) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems. Problems include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are able to use these operations flexibly.

Multiplication and Division

Multiplication and Division Facts

To make connections between arrays, number patterns, and counting in twos, fives and tens.

Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of

objects, numbers and quantities

Solve Problems

To solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Fractions, Decimals and Percentages

Recognise, Finding and Naming Fractions

To recognise, find and name a half as one of two equal parts of an object, shape or quantity *by solving problems*.

To recognise, find and name a quarter as one of four equal parts of an object, shape or quantity *by solving problems*.

To connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.

Measurement

Describe, Measure, Compare and Solve (All Strands)

To compare, describe and solve practical problems for: lengths and heights, mass/weight, capacity and volume, time.

To measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time.

To move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units using measuring tools, such as a ruler, weighing scales and containers.

Telling Time

To sequence events in chronological order using language.

To recognise and use language relating to dates, including days of the week, weeks, months and years.

To tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

Properties of Shapes

Recognising 2D and 3D shapes and their Properties

To recognise, handle and name common 2D and 3D shapes in different orientations/sizes and relate everyday objects fluently.

To recognise that rectangles, triangles, cuboids and pyramids are not always similar to each other.

Position and Direction

Position, Direction and Movement

To describe position, direction and movement, including whole, half, quarter and three-quarter turns *in both directions and connect clockwise with the movement on a clock face*.

To use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.