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RYTON FEDERATION
Ryton Federation of Infant and Junior Schools

EYFS Curriculum Pathway – Mathematics

Our EYFS Curriculum Pathway to KS1 builds on pupils' past knowledge and prepares them well for the learning that is to come in KS1.

The most relevant early years outcomes for mathematics are taken from the following areas of learning:

- Communication and Language
- Mathematics

The EEF summary of recommendations in relation to improving early mathematics include; *develop practitioners understanding of the teaching of early maths, dedicate time for children to learn maths and build it into daily routine, use manipulatives and representation to develop understanding, ensure that teaching builds on what children already know, use high quality, targeted support to help all children learn Mathematics.* Jan 2020.

Mathematics – Mathematical Vocabulary		
	A Unique Child	What this looks like at Ryton Federation
Mathematical Vocabulary	To build up vocabulary that reflects the breadth of their experiences. To extend vocabulary, especially by grouping and naming, exploring the meaning and sounds of new words.	Children are provided with lots of Mathematical play based opportunities in all areas of the classroom which they can use independently or alongside an adult. The environment is set up with key Mathematical opportunities – numbered pencil pots and jugs shadowed to be ordered biggest to smallest etc. Staff model key mathematical vocabulary in real life contexts through message board, during register time and lining up and mathematics opportunities are embedded in our daily routine. This is where we also address any misconceptions sensitively. Maths is taught individually, in small groups and as a whole class. Key vocabulary is introduced and discussed and resources from teaching sessions are available in play so that children can practise playing mathematically and using the language in play/independently. Mathematical vocabulary is key to future learning and is always explicitly taught. The meaning of key mathematical terms and concepts are discussed with the children and displayed in class when being taught. We use lots of different words for concepts (e.g. take away, minus, subtract, less, fewer etc) to broaden children's

		vocabulary and ensure that key mathematical vocabulary is applied in different contexts to ensure it is understood. The way our environment and daily routine is constructed means that there are overwhelming opportunities for children to hear and use a rich mathematical vocabulary. We encourage children to use key mathematical vocabulary when playing and learning during activities and then help them to apply this learning when they are reasoning and solving problems.
Mathematics – Number and Place Value		
Counting	To recite numbers in order to 10. To realise not only objects, but anything can be counted including steps, claps or jumps. To count up to three or four objects by saying one number name for each item. To count out up to six objects from a larger group. To count actions or objects which cannot be moved. To count objects to 10 and beginning to count beyond 10. To count an irregular arrangement of up to ten objects. To estimate how many objects they can see and check by counting them. To count reliably with numbers from one to 20.	Children practise rote counting from an early age, through songs and rhymes, rote counting at message board time, in daily routine e.g. when lining up and discrete maths lessons/activities. Every opportunity is seized. Children see practitioners modelling counting for a purpose. Games are played which include counting actions/sounds as well as physical objects in order to develop children's fluency and number sense. We explicitly teach careful counting techniques – count everything once, say the numbers in the right order, the last number is how many. We teach children to say what they see without counting, developing subitising. We practise starting and stopping the count at different points - not always at zero/one when rote counting. When objects cannot be moved we teach children how to find logical starting and ending points for the count and use strategies such as marking off items counted. Children have lots of opportunities to count objects and staff model and teach children to move/line up items to make sure that the count is accurate. We play estimation games and teach children about subitising both regular and irregular number patterns. We ensure that children see numbers represented in lots of different ways – Numicon, cubes, ten frames, dice patterns, tallies etc. We encourage children to use this knowledge to try to estimate small numbers and count to check, this is often built into the daily routine/environment E.g. estimation station etc. Children are taught to count in steps – 2, 5, 10 and solve problems of counting larger groups using this knowledge.
Identifying, Representing and Estimating	To use some number names and number language spontaneously. To know that numbers identify how many objects are in a set.	**All Mathematical concepts follow Concrete – Pictorial – Abstract.** Concrete – opportunity to use concrete objects, manipulatives to learn

	To show an interest in representing numbers. To begin to represent numbers using fingers, marks on paper or pictures. To separate a group of three or four objects in different ways, beginning to recognise that the total is still the same. To sometimes match numeral and quantity correctly. To select the correct numeral to represent 1 to 5, then 1 to 10 objects. To say the number that is one more than a given number. To find one more or one less from a group of up to five objects, then ten objects. To say which number is one more or one less than a given number from one to 20.	Pictorial – build on the concrete approach by using pictorial representations which can be used to problem solve and reason Abstract – with the foundations firmly laid – using numbers and key concepts in a more formal way with confidence. Children have access to a range of manipulatives and are taught how to use these in Mathematics sessions but are also then left for independent exploration and often used creatively in areas E.g. Numicon in Playdough. These include Numicon, tens frames, cubes, coins, number lines. Each concept is taught using a range of these manipulatives to help develop children's fluency and provide opportunities for children to apply their skills to new situations and using new resources. Children are encouraged to mark make mathematically in different areas, with different tools and media and on different surfaces. Children's mathematical graphics such as shapes, a spider with 20 legs/8 legs or writing numerals for pleasure gives us an insight into children's mathematical thinking and current ability. This may happen during play or as a set challenge – tallying which role play area we should have next, favourite fruit etc. This is encouraged both inside and outside. Children are encouraged to link numeral and amount in the environment, daily routine and in carefully designed teaching session working with the child's ZPD. We plan engaging activities which are purposeful and problem solving which increases children's motivation. At this point we encourage children to problem solve and reason using their mathematical knowledge. This helps staff to challenge children embedding a deeper understanding of mathematical concepts. The 6 key areas of early mathematical learning which collectively provide a platform for everything children will encounter as they progress through their maths learning at school and beyond are; Cardinality and Counting, Comparison, Composition, Pattern, Shape and Space and Measures. We use NCETM Mastering Number, Nrich activities and White Rose Long resources to support our teaching in these areas. Intervention takes place in small groups or in targeted play to ensure that children 'keep up' in all areas of Mathematics.
Reading and Writing Numbers	To show an interest in numerals in the environment. To use some number names accurately in play.	We begin with the numbers which are important to the children, age, house number etc. and draw their attention to the numerals in the home, school and local environment.

	To recognise some numerals of personal significance. To recognise numerals 1 to 5.	Interactive number line, pencil pots, display, play numerals in different areas – there are numerals both inside and outside the classroom. We teach children to write numerals using formation ditties and recognising that we have to go clockwise when writing some of them. We encourage children to write them in sand, glitter, gloop, foam as the sensory experience enhances learning. To help children to recognise numerals we ensure that children are exposed to numerals, that there are opportunities for over learning through repetitive games, tasks which involve numerals in many different contexts.
Compare and Order Numbers	To compare two groups of objects, saying when they have the same number. To use the language of 'more' and 'fewer' to compare two sets of objects. To place numbers one to 20 in order.	Message board – how many children are here? Absent? In Reception we look at the 'difference' between numbers. Which is higher, lower how much higher/lower. We introduce children to the concept of more and fewer practically in play – water, sand etc. and discuss the concept/encourage children to use the word 'fewer'. We play games such as higher/lower, I'm thinking of a number etc… All maths is built into real life scenario where possible. When ordering numerals we teach children to order consecutive numbers and non-consecutive numbers.
Understanding Place Value	To show curiosity about numbers by offering comments or asking questions.	We encourage curiosity around numbers and we play with numbers, we try things out and encourage children to 'wonder'. Our ethos is not about getting things right/wrong but about 'having a go' and trying different ways to do things. When teaching the teen numbers we teach the children what the one represents and we use tens frames and Numicon to help children to understand the concept.
Solve Problems	To show an interest in number problems. To begin to identify own mathematical problems based on own interests and fascinations.	We solve real life mathematical problems and in our daily routine and often skilfully 'create problems' for children to solve. Not enough snack to go around, bag is too heavy, no round shapes etc. Problems are built into provision and adult led activity. We encourage children to use what they have learned and apply it – showing children that mathematics knowledge is useful and developing fluency and number sense.
Mathematics – Addition and Subtraction		
Mental Calculations	To find the total of items in two groups by counting all of them.	We teach children strategies to solve addition problems – beginning with counting all, then moving onto counting on from a known number to counting on from the largest number etc. We use models and images after exploring

	To begin to use the vocabulary involved in adding and subtracting in practical activities and discussion. To add and subtract two single-digit numbers and count on back to find the answer using quantities and objects.	concrete resources and teach the children the associated vocabulary. When subtracting we move from using the language of subtraction during number songs and rhymes. We practise taking away objects, fingers and move on to using number tracks and number lines. We use Numicon to look at the difference between numbers. We teach children how to use construct number sentences verbally and indifferent ways E.g. 5 is equal to 3+2 and 3+2 makes 5. We teach children to use manipulatives and resources such as, objects, fingers, number tracks before teaching children how add and subtract using number lines and known facts. We also address commutativity and teach this from the onset in a play based way then using more structured resources such as dominoes.
Solve problems	To solve problems, including doubling, halving and sharing.	Mathematical problems are often real life problems which are taught using concrete resources. Children need to be able to half objects and understand the meaning of half before they are taught how to half numbers. The same goes for the concepts of doubling and sharing. When children have a good understanding of a concept they are then encouraged to apply the knowledge to solve problems and reason – master approach.
Mathematics - Measurement		
Describe, Measure, Compare and Solve (all strands)	To order two or three items by length or height. To order two items by weight or capacity. To use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and solve problems.	We create and seize spontaneous, real life opportunities to measure and compare length, height, weight and capacity. Language and concepts are taught in discrete sessions but there are planned opportunities in our continuous provision and challenges in our environment where comparing and ordering are encouraged. Real life, concrete opportunities are planned e.g. measuring things we have planted, exploring weight, time and capacity when baking/cooking/, going to the shop when learning about money. Comparing time, position and distance when playing races/obstacle courses.
Telling the Time	To use everyday language related to time. To order and sequence familiar events. To measure short periods of time in simple ways.	Real life opportunities to measure/compare measure time – cooking, sequencing daily routine, sand timers, races, playing with clocks, learning about day and night, now and next, role play. Provision challenges Language of concept taught in discrete sessions and when playing with children. Children are encouraged to use the language of time.
Money	To begin to use everyday language related to money.	Real life opportunities to use money – shopping, ordering amounts, looking at coins, prices, role play shop with tills. Provision challenges

		Language of concept taught in discrete sessions and when playing with children, in small groups and as a whole class. Children are encouraged to use the language of money.
Mathematics – Properties of Shapes		
Recognise 2D and 3D shapes and their properties	To show an interest in shape and space by playing with shapes or making arrangements with objects. To show interest in shape by sustained construction activity or by talking about shapes or arrangements. To show interest in shapes in the environment. To use shapes appropriately for tasks. To begin to talk about shapes in everyday objects, e.g. 'round' and 'tall'. To begin to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. To select particular named shapes. To explore characteristics of everyday objects and shapes and use mathematical language to describe them.	Children explore shape in many areas of the classroom such as construction and block areas as well as in junk modelling and dough. We teach children the correct mathematical shape names and vocabulary when they are ready. We look at real shapes in our immediate environment before moving on to more pictorial/abstract shapes and play shape hunts. We play games such as feely bag, magic bag and learn about shapes through stories, songs and rhymes.
Compare and Classify Shapes	To show awareness of similarities of shapes in the environment.	We solve problems using shapes and sort shapes, saying why they belong to a particular group. Children are taught to investigate shapes saying which properties are shared with other shapes or unique to that particular shape. Children investigate shape independently within provision using objects for a particular purpose, exploring concepts and embedding knowledge.
Mathematics – Position and Direction		
Position, Direction and Movement	To use positional language. To describe their relative position, such as 'behind' or 'next to'.	Prepositions are taught 1:1 In play, in groups and whole class. Hiding and finding items, treasure hunts and games of hide and seek support the development of these concepts in a concrete way before moving to pictorial understanding of these concepts using pictures and talking about the position of items/characters in pictures.
Patterns	To use familiar objects and common shapes to create and recreate patterns and build models.	Resources in provision encourage children to explore pattern. In our daily routine we look at patterns such as lining up- boy, girl etc.

	To recognise, create and describe patterns.	Challenges in environment encourage children to complete patterns – linked to coding. We encourage children to continue patterns, make own patterns, work out the rule and explain the pattern.
Mathematics - Statistics		
Record, Present and Interpret Data	To record, using marks that they can interpret and explain.	We model and teach children how to mark make mathematically. We use tallies, pictograms, mathematical recoding to prompt discussion, reasoning, interpretation. Children are encouraged to discuss their findings and include mathematical evidence to support these findings. Children are then challenged further to use data in problem solving and reasoning activities.