## West Earlham <br> Infant \& <br> Nursery School

## Calculation Policy

## Rationale

As stated in our Maths Policy, at West Earlham Infant and Nursery School we consider mathematics an essential skill in everyday life. Therefore it is vital that children understand how to perform each of the four operations: addition, subtraction, multiplication and division. The Calculation Policy ensures consistency in teaching throughout the school.

## Aims

- To provide a consistent approach to performing the four operations across the school.
- To offer opportunities for rigorous use of mental maths methods to develop fluency.
- To practise and secure efficient written methods which have a firm grounding in learning and reasoning.
- At West Earlham Infant and Nursery school communication skills are very important. We believe that children need to be able to speak mathematically in order to think mathematically. We teach children the mathematical vocabulary they need to enable them to talk about, and explain, their mathematics to others. We have a maths word of the week in all Key Stage 1 classes and these words are then displayed on the maths working wall.
- For each mathematical operation, teachers support and guide children through the following important stages:

1. Pre-calculation skills:

- Counting objects (including solving simple concrete problems)
- Conservation of number
- Counting as reciting and enumerating
- Recognition of place value

2. Calculation skills:

- Using concrete materials, e.g. counters, Numicon and bead strings to represent numerical activities.
- Using pictures and a mixture of words and symbols to represent numerical activities.

3. Using standard symbols and conventions.
4. Using jottings, e.g. empty number lines to aid a mental strategy.
5. Using informal written methods, e.g. expanded horizontal method.

- This policy supports the following progression in the development of calculation skills:
- Counting of objects
- Early stages of mental calculations and learning of number facts
- Calculating with larger numbers using informal jottings.
- Calculating informal written methods.
- Developing efficiency with informal written methods


## Teaching

- When teaching place value we read the value of each digit as hundreds, tens and ones.
- We read all numbers written during mathematics lessons out loud correctly, e.g. 2016: "two thousand and sixteen", 100: "one hundred".
- We use the word 'calculation' or 'number sentence', not 'sum', which is a synonym for 'add'.
- Any written calculation is presented horizontally and in a 'complete' way, e.g. use of ? or $\square$ to represent any unknown numbers or values, to reinforce the idea of 'balance'.
- Bar modelling is gradually introduced into maths teaching across the key stages to support children in bridging the gap between concrete, pictorial and abstract mathematical thinking.
- We read out what we are writing when doing any mathematical recording.
- Children are expected to answer spoken questions in complete sentences and to include a rationale in their answer, e.g. "...because..."
- Teachers use every opportunity to teach and reinforce the understanding of equivalence = as 'equal to' rather than 'the same as' or 'makes'. Strategies to achieve this include presenting calculations in different order, e.g. $30=2+10,10+20=30$. This can be demonstrated by providing children with balance scales and Numicon to complete missing number calculations.
- Children are shown how to set out their mathematical recordings clearly and neatly.
- We teach children signs/actions for the four operations.



## Importance of vocabulary

The 2014 National Curriculum places great emphasis on the importance of pupils using the correct mathematical language as a central part of their learning. Children will be unable to articulate their mathematical reasoning if they lack the mathematical vocabulary required to do so. It is therefore essential that teaching using the strategies outlined in this policy is accompanied by the use of appropriate mathematical vocabulary. New vocabulary should be introduced in a suitable context (for example with relevant real objects, apparatus, pictures or diagrams) and explained carefully. High expectations of the mathematical language used are essential, with teachers modelling and only accepting what is correct. The progression of the vocabulary through the year groups can be seen in the Maths Progression of Skills document.

| ADDITION |  |  |
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| EYFS | Year 1 | Year 2 |
| EYFS Framework Objectives: <br> - Have a deep understanding of number to 10 , including the composition of each number. <br> - Subitise (recognise quantities without counting) up to 5 . <br> - 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. <br> - Verbally count beyond 20, recognising the pattern of the counting system. <br> - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. <br> - Explore and represent patterns within numbers up to 10 , including evens and odds, double facts and how quantities can be distributed equally. | Curriculum Objectives: <br> - Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs. <br> - Represent and use number bonds and related subtraction facts within 20. <br> - Add and subtract one-digit and two-digit numbers to 20 , including zero. <br> - Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems. | Curriculum Objectives: <br> - Solve problems with addition and subtraction: <br> - using concrete objects and pictorial representations (numbers, quantities and measures) <br> - applying their increasing knowledge of mental and written methods. <br> - Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 . <br> - Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <br> - a two-digit number and ones <br> - a two-digit number and tens <br> - two two-digit numbers <br> - adding three one-digit numbers. <br> - Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. <br> - Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. |
| Children will: <br> - Sing and respond to nursery rhymes and counting songs - counting on and back. <br> - Through play and using visual prompts around the classroom children will become confident in counting forwards and backwards. <br> - Take part in practical activities discussing and using objects and modelling with a variety of counting objects. | Children will: <br> - Know by heart number bonds to 10. <br> - Know how to work systematically and spot patterns to derive number bonds to 20 . <br> - Know how to work systematically and spot patterns to derive number bonds for any number within 20. <br> - Use a variety of practical apparatus to represent a calculation: fingers, Numicon, real-life | Children will: <br> - Know by heart number bonds to and within 5 , 10, 20 and 100. <br> - Recall number facts e.g. If we know $4+5=9$, we also know: $5+4=9,14+5=19,5+14=$ 19 etc. <br> - Use mental methods to work out a calculation. <br> - Use the partitioning method to add tens and ones. |


| ADDITION |  |  |
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| EYFS | Year 1 | Year 2 |
| - Use one-to-one correspondence using moveable objects e.g. <br> - Real-life apparatus (money) <br> - Objects <br> - Multilink <br> - Count sets of objects in play and learn to recognise them. <br> - Practise writing numbers to 10 . Teachers will emphasise the order in which a number is written (tens then ones). <br> - Begin to add using fingers, Numicon and objects. <br> - Begin to add using objects by counting on in ones. <br> - Begin to record additions using the written method to 10. <br> - Know by heart number bonds to 5 . <br> - Subitise amounts to 5 . <br> - Children who are fluent with addition using objects or Numicon will begin to use number lines (with numbers on) to add by counting in ones, starting with the greatest number and counting on the smaller number. | apparatus, objects, Dienes, multilink. <br> - Use mental methods to work out an addition. <br> - Know to start with the biggest value in their head and count on when adding. <br> - Recall number facts e.g. If we know $4+5=9$, we also know: $5+4=9,14+5=19,5+14=$ 19 etc. <br> - Use number lines and number tracks (with the numbers on) to add by counting in ones, starting with the greatest number and counting on the smaller number (counting more). | - Group into tens and ones. <br> - Use the written method. <br> - Children who are fluent with previous written methods and place value may be introduced to the expanded addition (column addition). |
| Concrete / Pictorial / Abstract: <br> Nursery <br> Before addition can be introduced, children need to have a secure knowledge of number. In Nursery, children are introduced to the concept of counting, number order and number recognition through practical activities and games. This is taught through child-initiated games such as 'hide and seek' and 'I spy'. Children also learn how to count 1:1 (pointing to each object as they count) and that | Concrete / Pictorial / Abstract: <br> - Joining two groups and then recounting all objects using one-to-one correspondence. $4+3=7$ | Concrete / Pictorial / Abstract: <br> - Partitioning one number, then adding tens and ones |


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| anything can be counted, for example, claps, steps and jumps. This is reinforced by opportunities provided in the outdoor area for the children to count e.g. counting building blocks, twigs etc. <br> Reception <br> Before addition can be introduced, children in Reception build on concepts taught in Nursery by working through the number objectives in the 40 60 month band of Development Matters. Children need to have a secure knowledge of number in order to begin addition. Children are then introduced to the concept of addition through practical games and activities. Children act out addition sums to physically add two groups of objects together and use arm gestures to represent the signs + and $=$. This is reinforced by opportunities provided in the outdoor area for the children to use addition e.g. adding together groups of building blocks, twigs etc. Children build on their previous knowledge of 'more' by learning that adding two groups of objects together gives them a larger number (more objects). Adults model addition vocabulary supported by age-appropriate definitions. An example of this is, "Addition means we add two groups together / we put 2 lots of objects together. Equals means we find out how many we have got altogether. 3 add 2 equals 5 . We have got 5 altogether." Adults support children in recording their addition calculations in the written form. | $5+3=8$ <br> Counting on <br> As a strategy, this should be limited to adding small quantities only (1, 2 or 3) with pupils understanding that counting on from the greater number is more efficient. <br> Pupils should be encouraged to rely on number bonds knowledge as time goes on, rather than using counting on as their main strategy. <br> - Part-part-whole <br> Teach both addition and subtraction alongside each other, as pupils will use this model to |  <br> Pupils can choose themselves which of the numbers they wish to partition. Pupils will begin to see when this method is more efficient than adding tens and taking away the extra ones, as shown. <br> Rounding one number, then adding the tens and taking away extra ones <br> Pupils will develop a sense of efficiency with this method, beginning to see when rounding and adjusting is more efficient than adding tens and then ones. <br> - Counting on in tens and hundreds |


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| $5+3=8$ <br> Use specific maths resources such as multilink, counters and Numicon to show addition as the combining of two amounts. <br> Two groups of pictures so children are able to see, and count, the total. <br> 1 more than 4 is 5 . | identify the inverse link between them. <br> Pupils could place ten on top of the whole as well as writing it down. The parts could also be written alongside the concrete representation. This model begins to develop the understanding of the commutativity of addition, as pupils become aware that the parts will make the whole in any order. $\begin{aligned} & 10=6+4 \\ & 10=4+6 \\ & 10-6=4 \\ & 10-4=6 \end{aligned}$ <br> - Regrouping ten ones to make ten <br> This is an essential skill that will support column addition later on. $\mathbf{3}+\mathbf{9}=3+9=12$ <br> ‘Make ten’ strategy | - Partitioning to add without regrouping <br> As in Year 1, this is a mental strategy rather than a formal written method. Pupils use the Dienes cubes (and later, images) to represent 3digit numbers but do not record a formal written method if there is no regrouping. <br> - Column method with regrouping <br> Dienes cubes should be used alongside the |


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| 1 more than 3 is 4 . <br> The parts are 2 and 4 , the whole is 6 . $6+4=10$ <br> The parts are 6 and 4 , the whole is 10 . | Pupils should be encouraged to start at the bigger number and use the smaller number to make ten. <br> The colours of the beads on the bead string or rekenrek make it clear how many more need to be added to make ten. <br> Also, the empty spaces on the ten frame make it clear how many more are needed to make ten. $9+4=13$ $9+5=14$ <br> 114 <br> - Adding 1, 2, 3 more | pictorial representations; they can be placed on the place value grid before pupils make pictorial representations. <br> As in Year 1, the focus for the column method is to develop a strong understanding of place value. <br> Part-part-whole <br> Pupils explore the different ways of making 20. They can do this with all numbers using the |


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| $00000000-00000-$ <br> $8+5$ <br> Use cubes to add two numbers together as a group or in a bar. | Here the emphasis should be on the language rather than the strategy. As pupils are using the bead string, ensure that they are explaining using language such as; <br> ' 1 more than 5 is equal to 6 .' <br> '2 more than 5 is 7. ' <br> ' 8 is 3 more than 5.' <br> - Adding three single digit numbers (make ten first) | same representations. <br> This model develops knowledge of the inverse relationship between addition and subtraction and is used to find the answer to missing number problems. <br> - Make ten strategy $\begin{gathered} 38+15= \\ 2<13 \\ 10 \end{gathered}$ <br> How pupils choose to apply this strategy is up to them, however, the focus should always be on efficiency. <br> - Using known facts Dienes cubes should be used alongside pictorial and abstract representations when introducing this strategy. |


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|  | $\begin{aligned} (4)+7+6 & =10+7 \\ & =17 \end{aligned}$ <br> Pupils may need to try different combinations before they find the two numbers that make 10. The first bead string shows 4, 7 and 6. The colours of the bead string show that it makes more than ten. <br> The second bead string shows 4, 6 and then 7. The final bead string shows how they have now been put together to find the total. <br> - Partitioning to add (no regrouping) <br> Place value grids and Dienes cubes should be used as shown in the diagram before moving | $\begin{aligned} & \because+\because=\therefore \\ &\\|\\|+\\|\\|=\\| \\|\\| \\| \\ & \square \square+\square \square=\square \square \\ & \square \square \square \square \\ & \square \square \square \end{aligned}$ | $3+4=7$ <br> leads to $30+40=70$ <br> leads to $300+400=700$ |

## ADDITION

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|  | onto the pictorial representations. <br> Dienes cubes should always be available, as the main focus in Year 1 is the concept of place value rather than mastering the procedure. <br> When not regrouping, partitioning is a mental strategy and does not need formal recording in columns. <br> This representation prepares them for using column addition with formal recording. <br> Introducing column method for addition, regrouping only <br> Dienes cubes and place value grids should be used as shown in the diagrams. Even when working pictorially, pupils should have access to Dienes cubes. <br> - Adding multiples of ten |  |

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## SUBTRACTION

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| EYFS Framework Objectives: |
| - 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. |

- 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.


## Curriculum Objectives:

- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals ( $=$ ) signs.
- Represent and use number bonds and related subtraction facts within 20.
- Add and subtract one-digit and two-digit numbers to 20 , including zero.
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.


## Year 2

## Curriculum Objectives:

- Solve problems with addition and subtraction: - using concrete objects and pictorial representations (numbers, quantities and measures)
- applying their increasing knowledge of mental and written methods.
- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers.
- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.


## Children will:

- Know by heart number facts to 20.
- Use number facts to 20 to derive number facts to 100.
- Use mental methods to work out a subtraction.
- Subtract on a number line: 74-27= .
- Put the smallest value at the beginning of the number line (underneath).


## SUBTRACTION

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| - Begin to record subtractions using the written | method to 10 (as a group / class first).

- Know number bonds to 5 , including subtraction facts.
- Children who are fluent with subtraction using objects will begin to understand subtraction by counting back on a number line.


## Concrete / Pictorial / Abstract:

## Nursery

Before subtraction can be introduced, children need to have a secure knowledge of number. In Nursery, children are introduced to the concept of counting backwards. This is taught through child-initiated games indoors and outdoors such as acting out counting songs and running races (children shouting " $5,4,3,2,1,0-\mathrm{GO}$ !").

## Reception

Before subtraction can be introduced, children in Reception build on concepts taught in Nursery by working through the number objectives in the 40 60 month band of Development Matters. Children need to have a secure knowledge of number in order to begin subtraction. Children are then introduced to the concept of subtraction through practical games and activities. Children act out subtractions to physically subtract a number of objects from a group. Children use arm gestures to
head and count back when subtracting

- Use number lines and number tracks (with the numbers on) to subtract by counting back in ones, starting with the greatest number and counting back the smaller number.
- Explore counting back to the second number to find the 'difference between' - emphasise the need to keep track of the number of jumps from 9 to 6 , i.e $8,7,6=3$ jumps, so $9-6=3$.


## Year 2

- Put the largest value at the end of the number line (underneath).
- Jump in ones until you reach a number in the 10x table.
- Jump in tens and ones until you reach the target number.
- Finally add up the jumps to find the answer.
- Count up to find the difference, 'Mollie has 20p, she spends 11 p, what will her change be?' Model counting up from 11 p to 20 p to find the difference.


## Concrete / Pictorial / Abstract:

Subtracting tens and ones


Pupils must be taught to partition the second number for this strategy.
Pupils will begin to see when this method is more efficient than subtracting tens and adding the extra ones, as shown.

## Subtracting tens and adding extra ones



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| represent the signs - and $=$. This is reinforced by opportunities provided in the outdoor area for the children to count e.g. counting building blocks, twigs etc. Children build on their previous knowledge of 'less' by learning that subtracting means taking away a certain number of objects from a group (leaving them with fewer objects). Adults model subtraction vocabulary supported by age appropriate definition. An example of this is, "Subtraction means we take away objects from a group / we have got fewer objects now. Equals means we find out how many we have got left. Wow! We have only got 3 left!" Adults support children in recording their subtractions in the written form. <br> Stories and rhymes where one is removed each time. <br> Use specific resources such as multilink, bead strings and Numicon to support the understanding of subtraction as 'taking away'. |  $6-2=4$ <br> When this is first introduced, the concrete representation should be based upon the diagram. Real objects should be placed on top of the images as one-to-one correspondence so that pupils can take them away, progressing to representing the group of ten with a tens rod and ones with ones cubes. <br> Counting back | Pupils must be taught to round the number that is being subtracted. <br> Pupils will develop a sense of efficiency with this method, beginning to identify when this method is more efficient than subtracting tens and then ones. <br> - Counting back in multiples of ten and one hundred <br> - Partitioning to subtract without regrouping |


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| EYFS | Year 1 | Year 2 |
| Use pictures to cross out 'taking away'. | 16-2 = 14 <br> Subtracting 1, 2, or 3 by counting back. Pupils should be encouraged to rely on number bonds knowledge as time goes on, rather than using counting back as their main strategy. <br> Part-part-whole <br> Teach both addition and subtraction alongside each other, as the pupils will use this model to identify the link between them. Pupils start with ten cubes placed on the whole. <br> They then remove what is being taken away from the whole and place it on one of the parts. The remaining cubes are the other part and also the answer. These can be moved into the | As in Year 1, the focus is to develop a strong understanding of place value and pupils should always be using concrete manipulatives alongside the pictorial. <br> Formal recording in columns is unnecessary for this mental strategy. It prepares them to subtract with 3-digits when regrouping is required. <br> Column method with regrouping <br> hundreds tens ones <br> $1^{3} 4^{17}$ <br> - 18 <br> 129 <br> As in Year 1, the focus for the column method is to develop a strong understanding of place value and pupils should always be using concrete manipulatives alongside the pictorial. Pupils are introduced to calculations that require |


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|  | second part space. <br> Make ten strategy <br> $14-5=9$ <br> (3) 4 $13-7=6$ <br> Single-digit number from a 2-digit number Pupils identify how many need to be taken away to make ten first. Then they take away the rest to reach the answer. <br> - Regroup a ten into 10 ones <br> After the initial introduction, the Dienes cubes should be placed on a place value chart to support place value understanding. This will support pupils when they later use the column method. <br> - Taking away from the tens | two instances of regrouping (initially from tens to one and then from hundreds to tens), e.g. 232 157 and are given plenty of practice using concrete manipulatives and images alongside their formal written methods, ensuring that important steps are not missed in the recording. Caution should be exercised on introducing calculations requiring 'regrouping to regroup' (e.g. 204 - 137) ensuring ample teacher modelling using concrete manipulatives and images. <br> - Bridging through ten <br> How pupils choose to apply this strategy is up to them. The focus should always be on efficiency. <br> - Using known number facts |

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|  | 34-17=17 <br> This example shows how pupils should work practically when being introduced to this method. <br> There is no formal recording in columns in Year 1 but this practical work will prepare pupils for formal methods in Year 2. |  |

## MULTIPLICATION

| EYFS | Year 1 |
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| EYFS Framework Objectives: | Curriculum Objectives: <br> - Have a deep understanding of number to 10, <br> including the composition of each number. <br> - Subitise one-step problems involving multiplication <br> and division, by calculating the answer using <br> counting) up to 5. quantities without |
| concrete objects, pictorial representations and |  |
| arrays with the support of the teacher. |  |

- 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.
- 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.


## Children will:

- In the context of play, and through adult directed learning, children will be encouraged to count groups and say one number for each group and then number each group.
- Group by moving objects into smaller groups or by gathering objects and counting in twos.
- Children will be encouraged to use specific language 'make four groups of two'.
- Be encouraged to share equally and fairly in the context of everyday life in the classroom.
- Start to double using apparatus / objects and fingers.


## Children will:

- Use visual models to support counting on and back in twos, fives and tens from any starting point.
- Count in multiples of twos, fives and tens and begin to recall the times table facts.
- Be encouraged to use known facts such as doubles and halves to support calculations.
- Represent multiplication as a repeated addition $2+2+2=6$.
- Use arrays to read and interpret repeated addition and the inverse relationship between multiplication and division $3 \times 5=5 \times 3=\square$.
- Use mental methods to work out a

Year 2

## Curriculum Objectives:

- Recall and use multiplication and division facts for the 2, 3, 5 and 10 multiplication tables, including recognising odd and even numbers.
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals ( $=$ ) signs.
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.


## Children will:

- Count in multiples of twos, threes, fives and tens and begin to recall the times table facts.
- Be encouraged to use known facts such as doubles and halves to support calculations.
- Represent multiplication as a repeated addition: $2+2+2=6,3+3=6$.
- Use arrays to read and interpret repeated addition, to show commutative relationships and the inverse relationship between multiplication and division $3 \times 5=5 \times 3=\square$.
- Use mental methods to work out a multiplication.

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| EYFS | Year 1 | Year 2 |
|  | multiplication. |  |
| Concrete / Pictorial / Abstract: <br> Nursery and Reception <br> By the end of Reception, children are expected to understand the concept of doubling and to be able to double a number up to 10 . Before doubling can be introduced, children need to have a secure knowledge of counting, number facts and addition. Children are then introduced to the concept of doubling through practical games and activities, including the use of the outdoor areas. Children act out 'doubling' by physically adding two equal groups together to find out the 'doubles' answer. | Concrete / Pictorial / Abstract: <br> - Skip counting in multiples of 2, 5, 10 from zero <br> The representation for the amount of groups supports pupils' understanding of the written equation. So two groups of 2 are 2, 4. Or five groups of 2 are 2, 4, 6, 8, 10. <br> Count the groups as pupils are skip counting. <br> Number lines can be used in the same way as the bead string. <br> Pupils can use their fingers as they are skip counting. <br> - Making equal groups and counting the total | Concrete / Pictorial / Abstract: <br> - Skip counting in multiples of 2, 3, 4, 5, 10 from 0 <br> Pupils can use their fingers as they are skip counting, to develop an understanding of 'groups of'. <br> Dotted paper is used to create a visual representation for the different multiplication facts. Each multiplication table has its own template, which is provided during taught units. <br> - Multiplication as repeated addition $5+5+5+5+5+5+5+5=$ $\square$ |

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|  |  | What multiplication and division equations can you write for each bar model? <br> Prove that the equations are correct using a bead string. <br> This link should be made explicit from early on, using the language of the part-part-whole model, so that pupils develop an early understanding of the relationship between multiplication and division. Bar models (with Multilink) should be used to identify the whole, the size of the parts and the number of parts. <br> - Doubling to derive new multiplication facts |

## MULTIPLICATION

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| EYFS | Year 1 |
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| EYFS Framework Objectives: | Curriculum Objectives: <br> - Have a deep understanding of number to 10, <br> including the composition of each number. <br> - Sublve one-step problems involving multiplication <br> and division, by calculating the answer using <br> concrete objects, pictorial representations and <br> counting) up to 5. |
| arrays quanth the support of the teacher. |  |

- 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.
- 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.


## Children will:

- In the context of play, and through adult-directed learning, children will be encouraged to count groups and say one number for each group and then number each group.
- Group by moving objects into smaller groups or by gathering objects and counting in twos.
- Be encouraged to share equally and fairly in the context of everyday life in the classroom.
- Start to halve using practical objects.
- Children will be encouraged to use specific language 'half', 'share' and 'equally'.
Concrete / Pictorial / Abstract: $\quad$ Concrete / Pictorial / Abstract:

| Nursery and Reception | - Sharing objects into groups |
| :--- | :--- |

## Children will:

- Use practical apparatus to share equally between a given number $15 \div 3=\square$
- Use practical apparatus to group equally e.g. 24 into equal groups of 2 s (links to arrays). How many groups of 2 in 10 ? (helps with 'chunking' later on).
- Recall related multiplication and division facts and explore inverse relationships.

Year 2

## Curriculum Objectives:

- Recall and use multiplication and division facts for the $2,3,5$ and 10 multiplication tables, including recognising odd and even numbers.
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals ( $=$ ) signs.
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.


## Children will:

- Use practical apparatus to share/group equally.
- Use mental methods to work out a division. $10 \div$ 2 = How many times does 2 go into 10?
- Recall related multiplication and division facts and explore inverse relationships $2 \times 4=8,4 \times$ $2=8,8 \div 2=4,8 \div 4=2$. I know double 2 is 4 , I know half of 4 is 2 .

| DIVISION |  |  |
| :---: | :---: | :---: |
| EYFS | Year 1 | Year 2 |
| By the end of Reception, children are expected to understand the concept of halving and sharing. Before this can be introduced, children need to have a secure knowledge of counting backwards, number facts and subtraction in order to halve and share. Children are then introduced to the concept of halving and sharing through practical games and activities. They act out 'halving and sharing' through activities such as sharing food for their Teddy Bear's Picnic and sharing resources equally to play a game. This is reinforced by opportunities provided in the outdoor area for the children to halve and share out objects such as building blocks, twigs etc. <br> Children have the opportunity to physically cut food, objects or shapes in half. <br> Counting and other maths resources for children to share into two equal groups. | There are 10 sweets. Ring groups of 2 . <br>  <br> There are $\qquad$ groups of 2 . <br> Pupils should become familiar with division equations through working practically. <br> The division symbol is not formally taught at this stage, although pupils should be introduced to it and recognise it. | Here, division is shown as sharing. If we have ten pairs of scissors and we share them between two pots, there will be 5 pairs of scissors in each pot. <br> Division as grouping <br> Here, division is shown as grouping. If we have ten forks and we put them into groups of two, |


| DIVISION |  |  |
| :---: | :---: | :---: |
| EYFS | Year 1 | Year 2 |
| Visual supports such as halving mats and part-part-whole, with the physical objects that can be manipulated. <br> Counters and other maths resources for children to explore sharing between 3 or more. |  | there are 5 groups. <br> - Use of part-part-whole model to represent division equations and to emphasise the relationship between division and multiplication <br> Pupils use arrays of concrete manipulatives and images of familiar objects to find division equations. <br> They begin to use dot arrays to develop a more abstract concept of division. |

## Other policies to refer to

a. Maths Policy
b. Teaching and Learning Policy
c. Assessment Policy
d. Feedback Policy

## Approval

This policy has been reviewed in line with the 2010 Equality Act and Public Sector Equality Act. Due regard has been given to equality.
This policy will be adopted in September 2022. The date of the next formal review will be May 2025 and every three years thereafter, unless statutory legislation changes.

Policy approved by the Head Teacher of West Earlham Infant and Nursery School.

