Southwark Diocesan
Board of Education
Multi-Academy Trust

THE NURSERY & INFANT SCHOOL

CALCULATION POLICY

REVIEWED: September 2024
NEXT REVIEW: September 2025

Minster Nursery and Infants Calculation Policy

The intent of this policy
To ensure all children leave our school with a secure understanding of the four operations and can confidently use and apply both written and mental calculation strategies in a range of contexts. It aims to ensure consistent strategies, models and images are used across the school to embed and deepen children's learning and understanding of mathematical concepts.

How should this policy be used?
This policy has been designed to support the teaching and planning of mathematics in our school and to provide parents, carers and families with an understanding of the methods we use to teach maths so that they can continue to support children at home. Strategies are set out in a Concrete, Pictorial, Abstract format (CPA); developed by American psychologist, Jerome Bruner and successfully used across the world. It has been found that mathematical concepts are learnt and embedded more easily when introduced with a concrete example first, regardless of age.

It is important to note that teachers will respond to the individual needs of the children in their classes. This policy lays out the general expectations of when each strategy will be introduced. It is important for children to learn and use a range of strategies, and learning a new strategy does not cancel out the use of a previously learned one.

At the early stages children are not required to learn written calculation methods. What is considered important at this stage is their understanding of the concepts, the practical application of these and fluency with numbers to 5. At this time they are encouraged to use their own method of recording their findings in whatever way they choose. However, when they are ready they will begin to be taught formal recording methods.

As children move through Key Stage 1 and become increasingly independent, they will be able to, and must be encouraged to, select those strategies which are most efficient for the task, using increasingly abstract methods.

The policy shows progression in all 4 operations separately, but they are not always taught separately – links are made between the calculations to support understanding.

Nursery

Before calculations can be introduced, children need to have a secure knowledge of number.

In Nursery, children are introduced to the concept of subitising, counting, number order and number recognition through practical activities,

Example songs e.g. '5 little ducks' '5 current buns' '10 green bottles' '1 potato, 2 potato' 'Once I caught a fish alive'.

Children also learn how to count 1-1 (pointing to each object as they count) and that anything can be counted, for example; claps, steps and jumps and that the last number counted is the number they have.

The children will be introduced to 5 frames and placing objects into 5 frames to support counting and subitising.

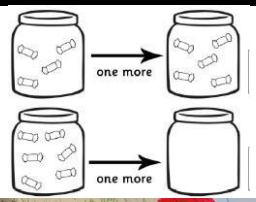
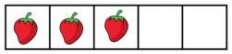
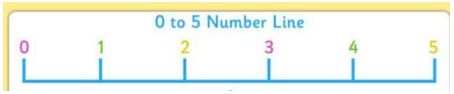
They are encouraged to 'see' numbers in the environment. Staff will create an environment to support early maths skills – handing things from trees or putting out numbers to match to amounts.

They are encouraged within their play to notice how numbers combine. For example, when playing at having tea and cake looking at the cake stand and saying 2 on the top, 2 on the bottom that's 4. The adult will initially model this language to the children.

Number expectations for the end of nursery:

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Recite numbers past 5.
- Say one number for each item in order: 1,2,3,4,5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals.
- Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'more than', 'less than'.

Addition – calculations strategies introduced in Reception:

Strategies	Concrete →	Pictorial →	Abstract
Knowing one more than a number. Beginning with finding 1 more using practical objects. Children should then make the link that 1 more is the next number when counting up in 1s. They can practice this through regular counting songs and games. Some books where there is one more thing on each page are useful for teaching this skill **Other Resources** The Gingerbread Man- Traditional Tale The Enormous Turnip- Traditional Tale The Very Hungry Caterpillar- Eric Carle Maisy goes Camping- Lucy Cousins – This book can also be used to look at one less and composition to 5, encourage children to use soft toys and a play tent to act out the story.	  Finding 1 more using objects means the children need to understand the word 'more' and can take another one and then accurately count their objects to see how many they have now. This is best done in context using objects of interest to the child. If we put one more sugar cube in the boat, will that sink it? how many is that?  The children could be encouraged to build staircases noticing there is 1 more cube each time. Play shopping and buy 1 more item each time. Play being a bus driver and picking up 1 more passenger each time. etc	  Can you put 1 more flower on your picture. How many flowers have you got now? You have 3 but I have 1 more than you, how many have I got? Ask children to make a number on a five frame.  Can you show me one more? Use a number track underneath the five frame. Can you point to the number you made? Can you point to one more than the number? 	Visualising – once the children have had lots of practice with; Objects Numicon Cubes Pictorial representations number tracks number lines and of course lots of counting practice They are then encouraged to visualise these in their heads to support adding one more automatically.

Combining 2 groups to make a whole

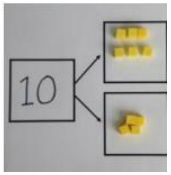
This is where children can combine 2 groups of objects to find how many there are altogether.

Board games are a good way to encourage adding the dots on 2 dice.

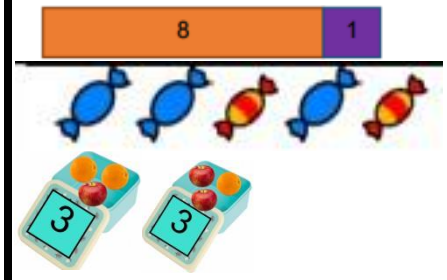
Books that support adding groups

Quack and Count by Keith Baker
Animals on board by Stuart Murphy






The children practice combining 2 groups in lots of different ways and a range of different vocabulary is used; add, plus, more. A part, part whole model is introduced.



The children can explore how a number can be partitioned in different ways, eg How many different ways can you find to put three fruits in the lunchbox?

The children are encouraged to become really familiar with small numbers, in order to be able to combine 2 groups up to 5 without counting, answering questions like; What is 1 add 3, without calculating.
We continue to combine groups with bigger numbers over the year.

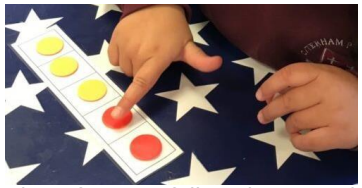
Subitising and describing composition of number

Subitising is where you learn to recognise amounts of numbers without counting.

Children can develop this skill with practice and by describing and recognising different patterns and compositions of objects and pictures.

This feeds into adding as the children begin to 'see' that 2 and 1 is 3 or 3 and 2 is 5.

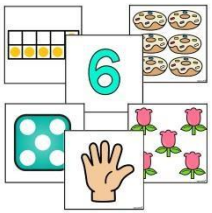

What do you see? I can see 3. 2 on one side and 1 on the other. 2 orange juice and 1 apple is 3 altogether.



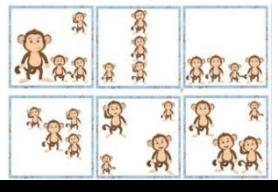
3 yellow and 2 red is 5.

The 5 frame is full so that must be 5, 2 red and 3 yellow.


What number have you rolled?
5, 4 in a square and 1 in the middle, 4 and 1 is 5.

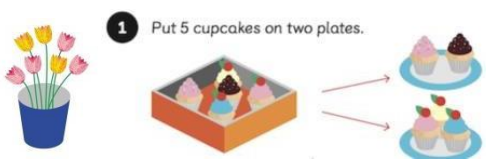
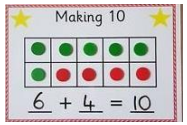
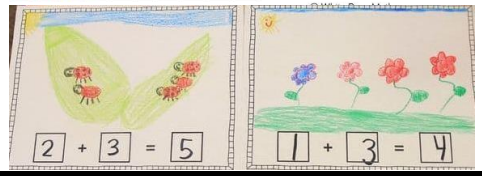
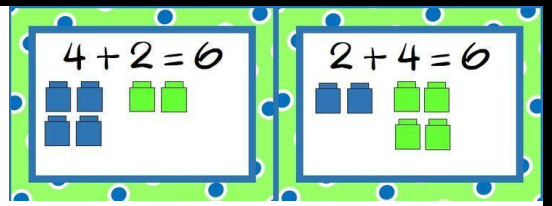
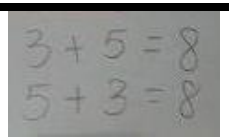


Subitising snap – match the cards that have the same number.
3 and 3 is 6 so that matches 5 on the bottom and 1 on the top.



Using cards like this the children can see that 3 and 1 is 4 in lots of different formations.

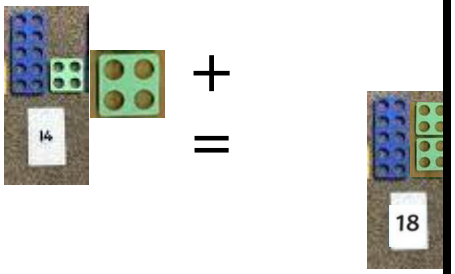
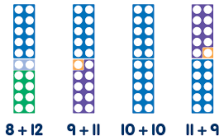
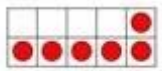
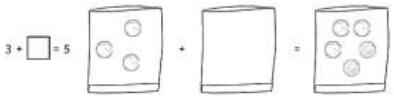
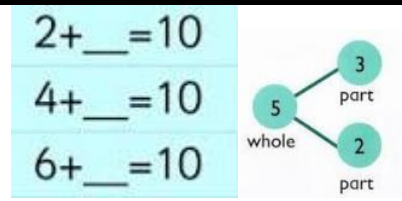
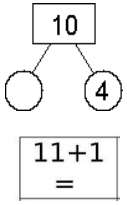
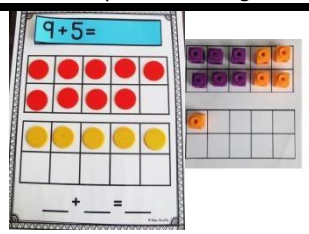
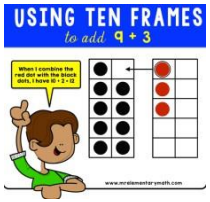
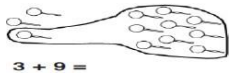
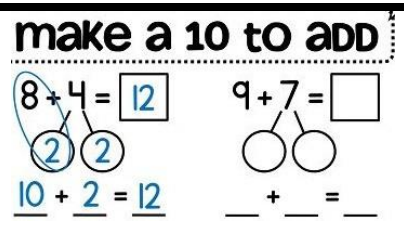
After all this concrete and visual practice the children are expected to be able to answer questions like, what is 3 and 2? Without calculating.

Finding number bonds. Understanding how numbers can be split into different parts and using this knowledge to support understanding, and re-call of how to make totals by adding two numbers together. In reception we focus on bonds to 5 and begin to learn our bonds to 10.	  The children practically find ways of splitting numbers into different parts. Using Numicon, part whole diagrams, tens frames, and a range of other models and images.	 	After all this concrete and visual practice the children are expected to be able to answer questions like, what is 4 and 1? Without calculating.
Creating number stories The children are encouraged to understand calculations as a process through understanding and creating their own number stories. These stories follow the structure of First, Then and Now.	 First there were 4 mini-beasts on the log. Then another 4 came along. Now there are 8.	 	There is no expectation in reception that the children need to read or write equations. We do however practice our number formation ready for year 1 and if the children are ready then we will introduce and encourage writing number sentences.
Understand commutative rule. Understanding that when solving addition calculations the order makes no difference to the result. Children in reception begin to learn this when learning all their number bonds to 5. For example if they know 4+1 then they also know 1+4.	3 + 5 = 8  5 + 3 = 8 		 There is no expectation that reception children need to write number sentences, however we do model them so they become familiar with the format, and if they are ready we encourage them to have a go.

Addition expectations by the end of Reception:

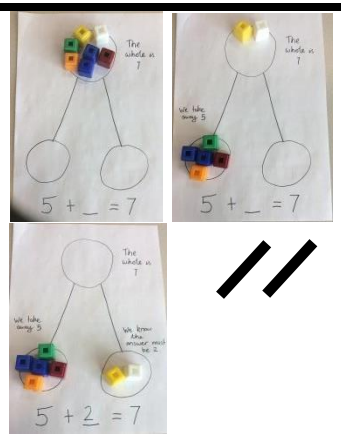
- I can subitise up to 5 (recognise quantities without counting)
- I can automatically recall number bonds up to 5 (without reference to rhymes, counting or other aids)
- I can automatically recall some number bonds up to 10 (without reference to rhymes, counting or other aids)

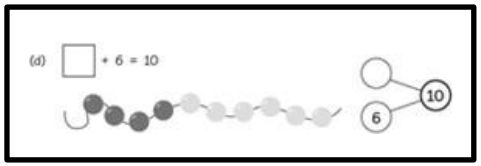
Addition – calculations strategies introduced in Year 1:

Strategies	Concrete	Pictorial	Abstract
Using number bonds to 10 to support adding to 20 and find missing numbers. Building on the number-bond work they have begun in reception. The children begin to use this to support adding up to 20 and finding missing numbers.	 The children Use practical resources to explore using what they've learnt to 10 e.g. 4+4 =8 and applying it to numbers to 20.  The children apply their practical experience with a ten frame to see the answers to missing number problems. e.g. 6 + _ =10	 The children can transfer their knowledge from the manipulation of practical resources to pictorial representations.   	  As the children become familiar with the different ways you can split numbers into 2 parts, they will be able to more easily complete missing number problems.
Bridging through 10 Understanding how numbers can be split to make 10 and a remainder, supporting addition of larger numbers.	 6+5=11 Start with the bigger number and use the smaller number to make 10.	 	

Use knowledge of subtraction to solve missing number additions.

Understanding that to find the answer to some missing number addition questions you can start with the total and subtract.





____+ 2 = 10
so 10 - 2 = 8

____ + 3 = 14

Reverse the calculation

14 – 3 = 11

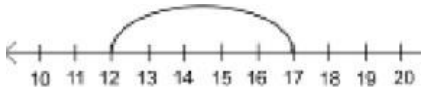
so 11 + 3 = 14

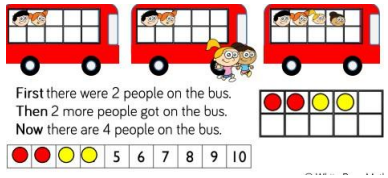
Counting on

Starting at one number and continuing to count on from there.
This can be first introduced by counting a number of objects into a box. (Could be based around a story) None are added or taken away so when we need to add more objects we can count on from the number in the box. All the objects can be retrieved from the box to check and demonstrate to the children that it is accurate.

Mouse Count – Ellen Stoll Walsh
Mr Gumpy's Outing – John Burningham
The Shopping Basket – John Burningham

Children can practice 'counting on' in lots of practical contexts: Dice games with a numeral dice and a dotted dice, where they can count on from the numeral. Using their fingers and using objects. Children should be encouraged to count on from the larger number, so for instance where numeral and dotty dice are used the numerals should be larger than the number of dots.





12 + 5 =

The children are encouraged to choose the most efficient strategy.

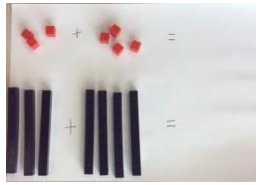
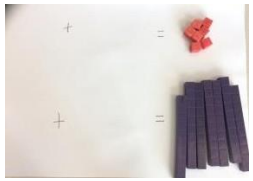
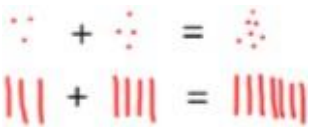
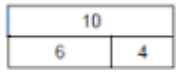
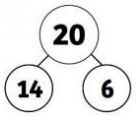
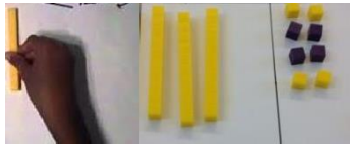
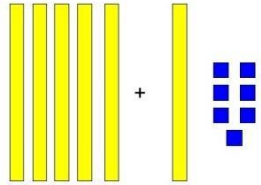
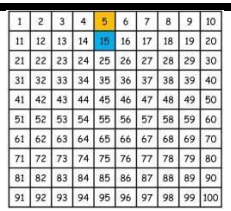
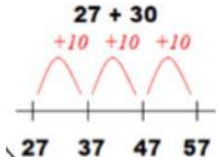
2 + 5 =

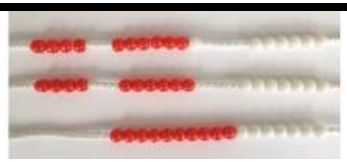
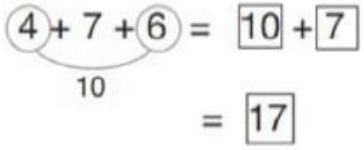
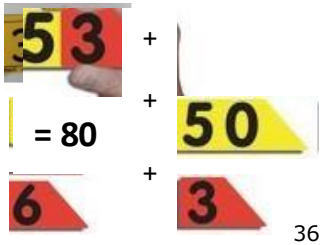
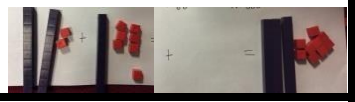
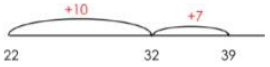
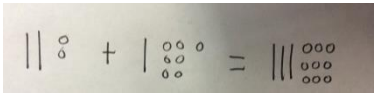
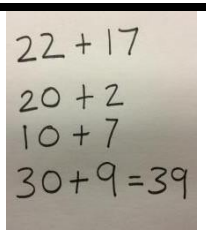
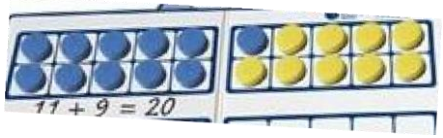
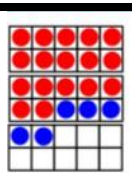
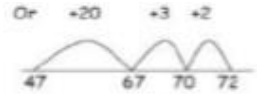
So they may be able to add 2 and 5 by getting 2 objects and 5 objects and counting them all but it would be quicker to count on from 5. (quicker still once they have learned 5+2 without calculating which is why in year 1 they continue to practice all their number bonds to 10 using a range of models and images to develop fluency)

Addition expectations by the end of Year 1:

- I can say 1 more than any number to 100
- I can use number bonds to 20 in addition
- I can add a one-digit to a two-digit number up to 20, including zero
- I can solve missing number addition problems using single digits.
- I can apply addition knowledge to solving 1 step problems.
- I can read and write addition equations.

Addition – calculation strategies introduced in Year 2

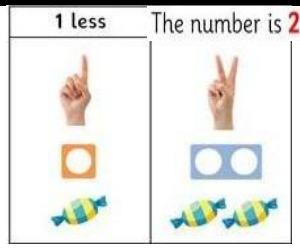
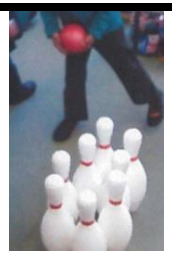
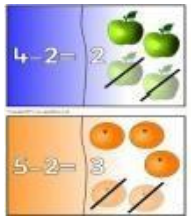
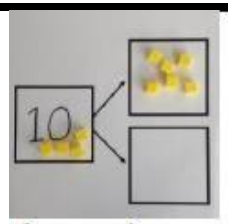
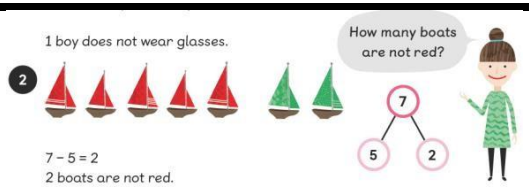
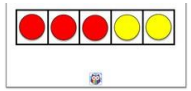
Strategies	Concrete →	Pictorial →	Abstract
Use known addition facts and apply to bigger calculations. Children can apply what they have previously learned about number bonds and apply it to larger numbers.	 	 3 + 4 = 7 so 30+ 40 = 70  SO 	If 3 + 4 = 7 then 30 + 40 = 70 If 3 + 4 = 7 then 13 + 4 = 17 If 3 + 4 = 7 then 3 + 14 = 17 If 3 + 4 is 7 then 23 + 4 = 27 If 3 + 4 is 7 then 3 add 34 =37
Add multiples of ten to any number Diennes or Numicon is a good way to introduce adding multiples of ten to any number and seeing that the ones remain the same. This can be done by drawing Diennes, drawing a blank number line or using a 100 square.	10+ 38 = or 38 + 10 = 	 50 + 17 =  5 + 10 = 15 	25 + 40 = (counting on in 10s) 25 – 35, 45, 55, 65 = 65

Adding in stages. In year 2 they will be looking for efficient calculation methods. When adding 3 single digit numbers they will be asked to look out for number bonds to 10 or easy doubles.		 **6 + 3 + 4 = 13**	
Partitioning Partitioning to add is where you split a number into tens and ones, adding the ones and then adding the tens. Diennes are a good way to do this initially as you can physically pick up the tens and ones and put them together.	36 + 53 =  36 + 53 = 89 	22 + 17   Children could draw Diennes to support their 2 digit number calculations, or they could use a blank number line to add the tens and then add the ones.	 Writing out the numbers in tens and ones can support addition.
Bridging 10 when adding multiple digits It is useful when adding 2 digit numbers to be able to make sets of ten. A very visual way of doing this is to use ten frames.		 17 + 5 = 22 Use ten frame to make 'magic ten  47 + 25 = 72	**25+48=73** 20 + 5 40 + 8 60 + 13 = 73

Addition expectations by the end of Year 2:

- I can recall and use addition facts to 10 fluently and immediately without calculation.
- I can add across 10 fluently without calculation aids (e.g. fingers or a number line)
- I can use knowledge of bonds to 10 to calculate bonds to 20 and apply to related facts to 100
- I can add three one-digit numbers
- I can recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- I can add 2 two-digit numbers within 100 (e.g. 48 + 35) using an efficient strategy and can demonstrate my method verbally, using concrete apparatus or pictorial representation

Subtraction – calculation strategies introduced in Reception:

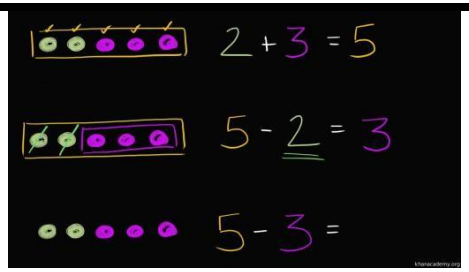
Strategies	Concrete	Pictorial	Abstract
Finding 1 less than a given number Children are able to understand the word 'less' and know that when finding 1 less they need to take one away and count the remainder.			Visualising – once the children have had lots of practice with; Objects, Numicon, Cubes Pictorial representations number tracks number lines and of course lots of counting practice They are then encouraged to visualise these in their heads to support finding one less automatically.
Taking away objects from a larger group Children are introduced to subtraction as taking away objects from a group and counting how many are left.	 This could be introduced as part of a game.  Or a part whole model could be used.	 Or it could be done by crossing out.	The children are encouraged to become really familiar with small numbers, in order to be able to subtract any number up to 5 without calculating, answering questions like; What is 3 take away 2, automatically We continue to practice subtraction with bigger numbers over the year.
Using bonds to support subtraction Knowledge of number bonds can support subtraction. If you know the parts that make the whole then you can identify which part is missing.	  10 – 6 =	  3 and 2 makes 5 so 5 – 2 must be 3 and 5 – 3 must be 2	After all this concrete and visual practice the children are expected to be able to answer questions like, what is 4 take away 2? Without calculating.

Understanding subtraction as an inverse.

This is essentially the same as using number bonds to support subtraction. If 1 and 1 is 2 the 2 -1 must be 1.

So we know that 2 add 2 is 4 and the children practice making the numbers in different combinations, on their fingers and with a range of objects.

So we can see if we hide one hand behind our back, then 4 take away 2 will be 2.



The children can use this method to support their learning of their subtraction number bonds to 5 automatically without calculation. We practice by getting them to visualise some of the methods we've been practicing like taking away fingers or looking at a five frame in 2 colours so they can 'see' what's left.

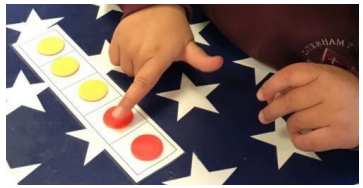
Subitising and describing composition of number

Subitising is where you learn to recognise amounts of numbers without counting.

Children can develop this skill with practice and by describing and recognising different patterns and compositions of objects and pictures.

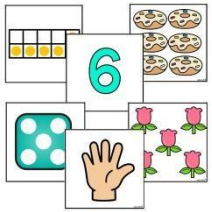
This feeds into subtraction as the children begin to 'see' that 2 and 1 is 3 so 3 is 'made of' 2 and 1 so if you took away the 2 you would still have the 1 and if you took away the 1 you would still have the 2.

What do you see? I can see 3. 2 on one side and 1 on the other. 3 juices take away 1 apple juices equals 1 orange juice left.

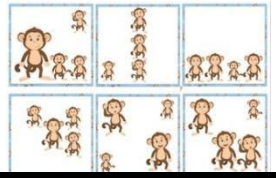


5 counters take away 2 red equals 3 yellow.

What number have you rolled?
4 it's like the 5 dice pattern but with one missing, so that must be 4.



Subitising snap – match the cards that have the same number.
The 10 fame have 5 empty squares so that must be 5 counters.

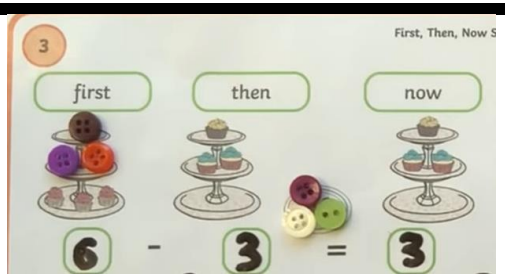


Using cards like this the children can see that 4 minus 1 is 3 in lots of different formations.

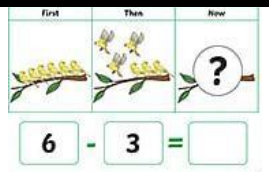
After all this concrete and visual practice the children are expected to be able to answer questions like, what is 5 – 2 =? Without calculating.

Creating number stories

The children are encouraged to understand calculations as a process through understanding and creating their own number stories. These stories follow the structure of First, Then and Now.



First there were 6 cup-cakes on the stand.
Then 3 got eaten.
Now there are 3 left.



First there were 6 birds in the tree.
Then 3 birds flew away.
Now there are 3 birds left.

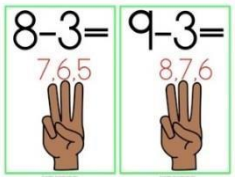
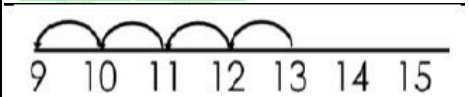
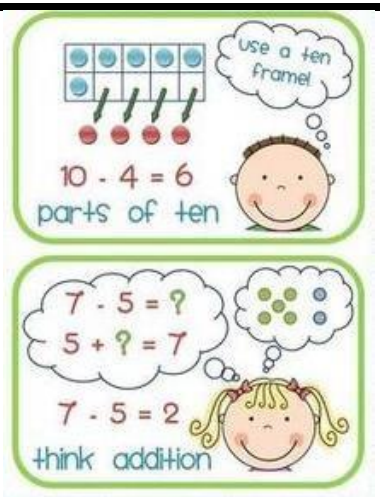
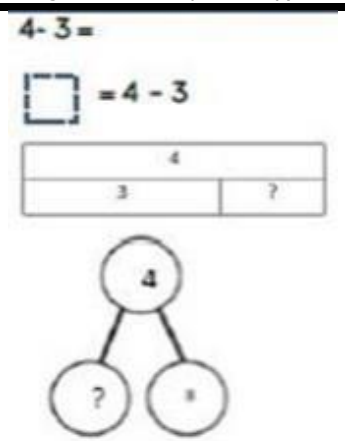
There is no expectation in reception that the children need to read or write equations. We do however practice our number formation ready for year 1 and if the children are ready then we will introduce and encourage writing number sentences.

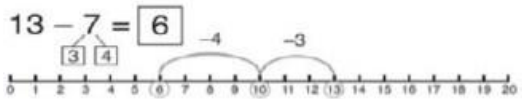
		 First there were 5 ducks on the pond. Then 2 swam away. Now there are 3 ducks left.	

Subtraction expectations by the end of Reception:

- I can automatically recall number bonds up to 5 as a subtraction (without reference to rhymes, counting or other aids)
- I can automatically recall some number bonds up to 10 as a subtraction (without reference to rhymes, counting or other aids)

Subtraction – calculation strategies introduced in Year 1:

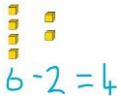
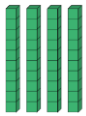
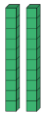
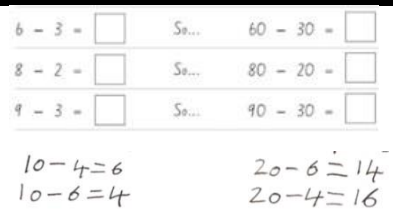
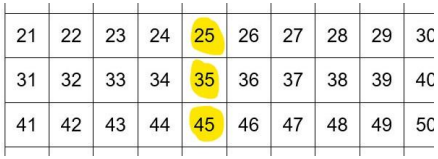
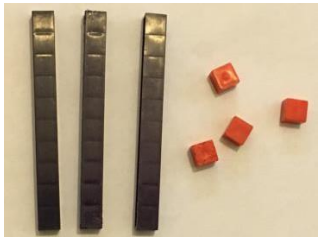
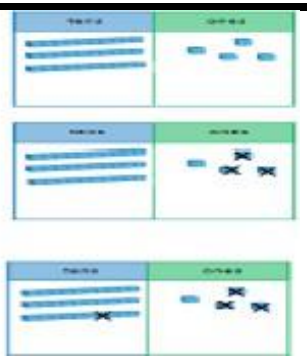
Strategies	Concrete	Pictorial	Abstract
Counting back Practicing counting down from 20 will support subtraction by counting back. The children can use their fingers, dice games or a number line. They can work out a subtraction by counting down the number they are subtracting.	 If using their fingers it is helpful if they put up the number of fingers the wish to subtract first. 	 When children are using a number line we ask them to count the jumps so they don't accidentally count the initial number they start on. 	17 - 5 = The children are encouraged to choose the most efficient strategy for subtraction. 10 - 2 = So they may be able to subtract 2 from 10 by getting 10 objects and taking away 2 objects then counting how many are left, but it would be quicker to back from 10. (quicker still once they have learned 10-2 without calculating which is why in year 1 they continue to practice all their number bonds to 10 using a range of models and images to develop fluency)
Using knowledge of addition to solve missing number subtraction problems. Understand the inverse This is essentially the same as using number bonds to support subtraction, using part whole knowledge to find missing numbers.			

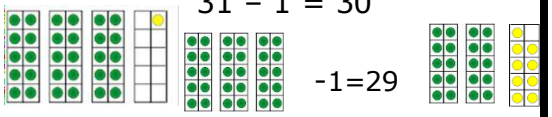
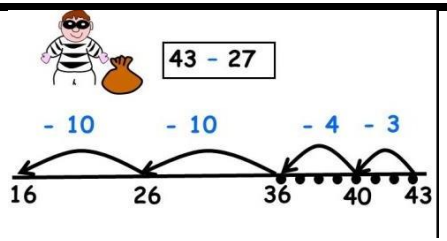
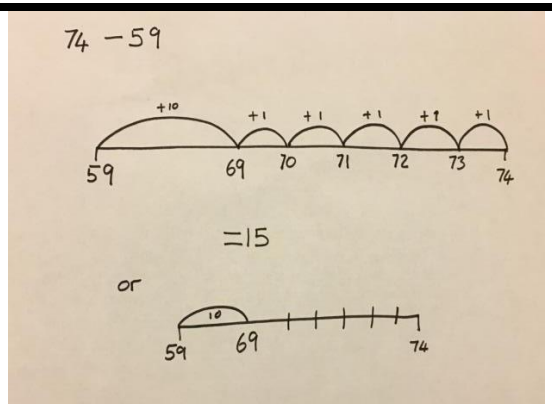
Bridging through 10 An efficient mental strategy for subtracting single digit numbers from 2 digit numbers can be to make ten, then take away the rest.	 14-5=9 We can easily take away the 4 to make 10. Then we know we just take 1 more = 9		16 – 8= How many do we take off to reach the next 10? How many do we have left to take off?

Subtraction expectations by the end of Year 1:

- I can say 1 less to 100
- I can use number bonds to 20 in subtraction
- I can subtract one-digit and two-digit numbers to 20, including zero
- I can solve missing number subtraction problems using single digits.
- I can apply knowledge of subtraction to problem solving problems including 1 step word problems.
- I can read and write subtraction equations

Subtraction – calculation strategies introduced in Year 2:

Strategies	Concrete →	Pictorial →	Abstract
Use known subtraction facts and apply to bigger calculations.	 **6 – 2 = 4**	    16-2 =14 60-20 = 40	 so
Subtract multiples of ten from any number	 45 - 20	45 - 20 	61 - 40 = 21
Partitioning Splitting two digit numbers into sets of 10 and ones and then subtracting.	34 – 13 = 21 	34-13=21 	72 – 38 = 34 72-30=42 42-8=34 "I know 72 take away 30 is 42. 42 take away 8 equals 34."

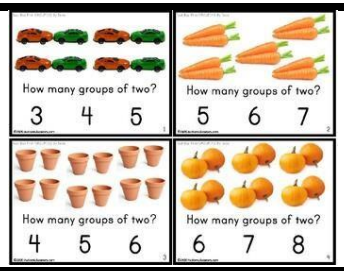
			
Bridging 10 when subtracting multiple digits	31 – 22 = 31 – 1 = 30  -1=29 29-20 = 9 		No number line: 23-15 = 23 – 3 = 20 20 – 2 = 18 18-10=8
Subtraction by counting on (finding the difference) One efficient method of subtraction can be to count on to find the difference. This is particularly true if you are subtracting a large number from another number quite close to it in quantity.	 Practical resources to visualise 'difference' and recognise inverse relationships e.g. 12-1=11 and 11+1=12  	 You begin with a blank numberline, the bigger number on the right smaller on the left. Then you begin on the smaller number and jump in tens then ones until you reach the bigger. Count up the sets of ten and 1s you jumped.	89 – 86 = 3

Subtraction expectations by the end of Year 2:

- I can recall and use subtraction facts to 10 fluently and immediately without calculation.
- I can subtract across 10 fluently without calculation aids (e.g. fingers or a number line)
- I can use subtraction facts to 20 fluently and use related facts up to 100.
- I can subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus (e.g. 72 – 17)
- I can understand the inverse of subtraction is addition and use this knowledge to check calculations
- I can recognise subtraction as a 'difference' and answer 'how many more?' questions.

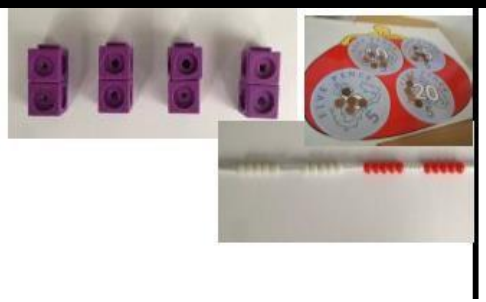
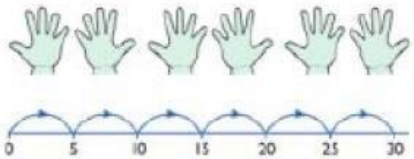
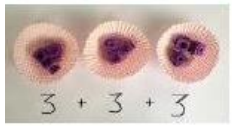
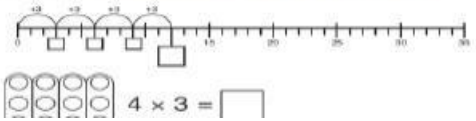
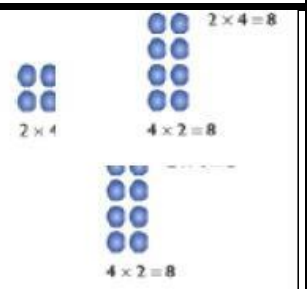
Multiplication – calculation strategies introduced in Reception:

Multiplication expectations by the end of Reception:

Strategies	Concrete →	Pictorial →	Abstract
Doubling In reception the children are introduced to the concept of doubling as adding together 2 numbers that are the same.	 Doubling and halving are introduced together to show their inverse relationship. For instance the children may be asked to find double 5 by putting five fingers up on each hand and then say the answer -10. Then asked to find half of 10 by moving them apart again.		In the early years children are not required to learn abstract forms of calculation methods. What is considered important at this stage is their understanding of the concepts and their practical application of these. They are encouraged to use their own method of recording their findings in whatever way they choose. They may however be taught abstract recording methods should they be ready.
Grouping things into 2s In reception the children begin to explore making groups of 2 and move onto exploring groups of bigger numbers.	 The children practice grouping things into 2s. Then we count how many pairs we have. They get themselves into pairs.		At this point the children are exploring putting things into groups and counting how many groups they have they do not yet use the vocabulary or symbolism for multiplication.
Exploring odds and evens The children begin to notice when a number can be put into groups of 2 and when there is 1 left over.	 The children are encouraged to notice which numbers are odd and which are even.	 The children look at how the odd and even numbers are distributed on a number line. They will begin to practice counting up and down in 2s with odd and even numbers.	At this point the children are exploring odd and even numbers, they do not yet use the vocabulary or symbolism for multiplication.

- I can automatically recall doubles up to double 5 (without reference to rhymes, counting or other aids)
- Explore and represent patterns within numbers up to 10, including evens and odds.

Multiplication – calculation strategies introduced in Year 1:

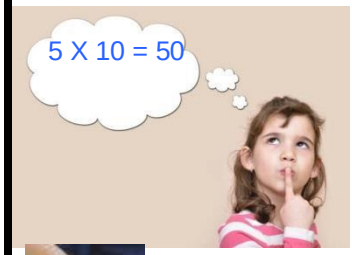
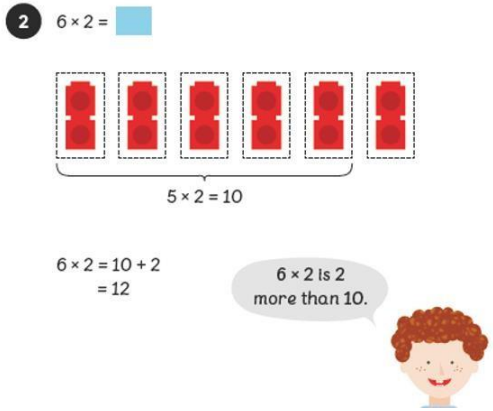
Strategies	Concrete →	Pictorial →	Abstract
Counting in multiples Children will need to practice skip counting in 2s, 10s and 5s. Once they can do this they can identify how many objects they have by counting in multiples.		Use a number line or pictures to continue support in counting in multiples.  	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30
Repeated addition Children are familiarised with the idea that multiplication is repeated addition so they can understand the basis behind multiplication and supports learning tables later.	 5+5+5=15  3+3+3=9	 Pupils begon to recognise the relationship between repeated addition and multiplication.  	The children can solve multiplication questions by using repeated addition. 4X3 = 3+3+3+3
Arrays Children learn the multiplication sign can mean; Sets of, groups of or rows of They are taught to arrange objects into arrays which support the understanding that multiplication is commutative and can be done in either order.	 	  	Begin to be able to visualise arrays for small sets of numbers, and count in multiples to answer questions like 2X3.

Multiplication expectations by the end of Year 1:

- I can use my knowledge of counting in 2s, 5s and 10s to solve multiplication problems.

Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

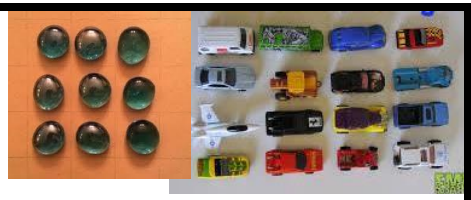
Multiplication – calculation strategies introduced in Year 2:

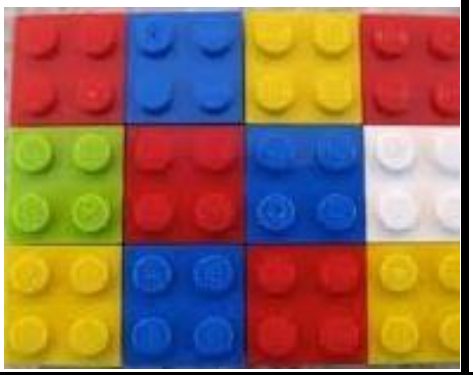
Strategies	Concrete →	Pictorial →	Abstract
Knowing times table facts. The children should be learning their multiplication facts for the 2s, 10s and 5s. They can use this knowledge and their understanding of multiplication as a repeated addition to answer questions they don't know by heart.	  5 X 9 = (subtract 5 from 50) 		If 5 times 2 is 10 then 50 times 2 must be 100.

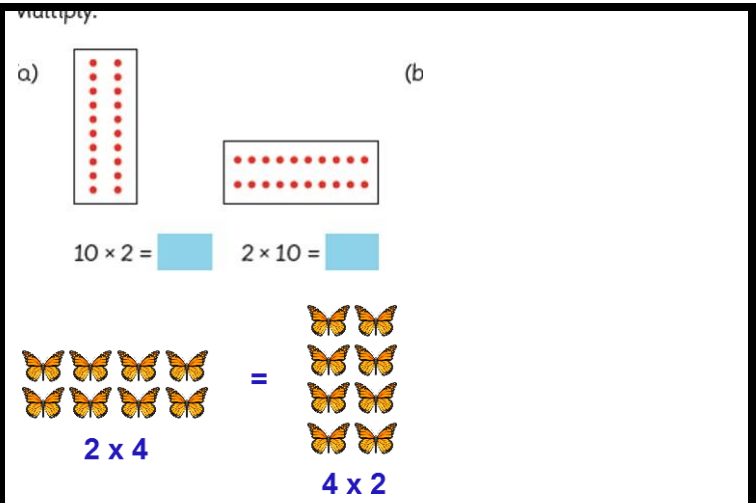
Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

Commutativity

Children can use their understanding of multiplication arrays to answer a wider range of multiplication questions.



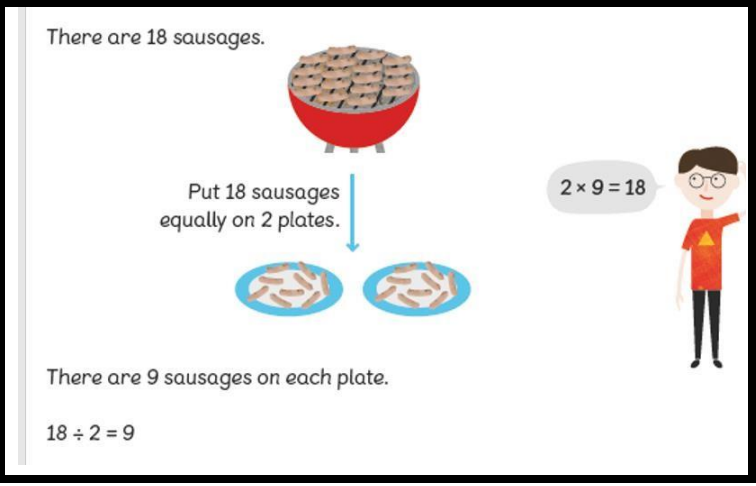


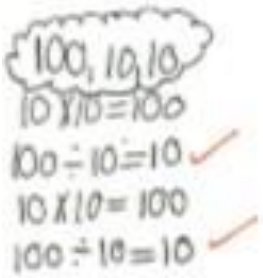


Using the inverse

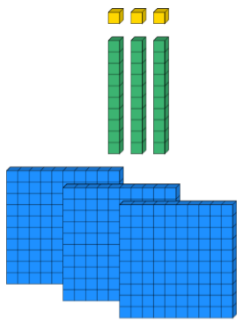
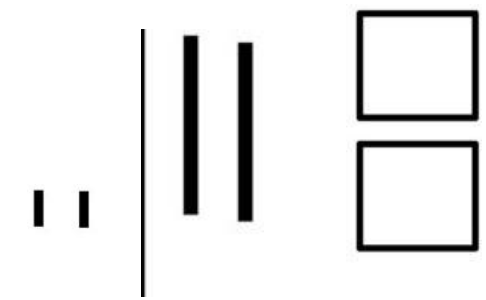
Children understand the relationship between multiplication and division.

24 divided by 3 =8
8 X 3 = 24





Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

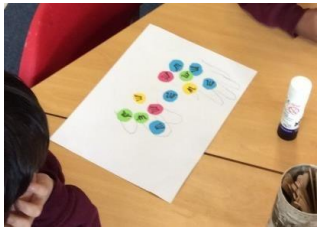
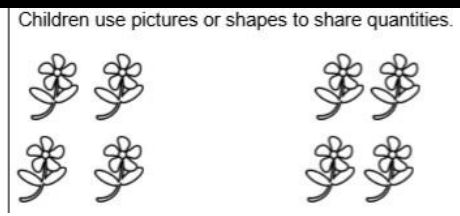
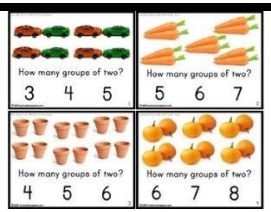
Applying knowledge of times tables to larger numbers.	 3 x 1 = 3 3 x 10 = 30 3 x 100 = 300	 2 x 1 = 2 2 x 10=20 2 x 100= 200	4 x 1 = 4 4 x 10 = 40 4 x 100 = 400

Multiplication expectations by the end of Year 2:

- I can recall and use multiplication facts for the 2, 5 and 10 multiplication tables to solve simple problems, demonstrating an understanding of commutativity as necessary, for example a grouping problem where the number of groups is unknown.
- I can recognise a repeated addition as a multiplication and write it as a multiplication equation.

Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

Division – calculation strategies introduced in Reception:

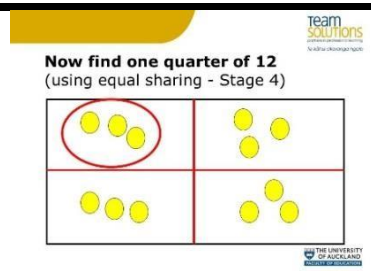
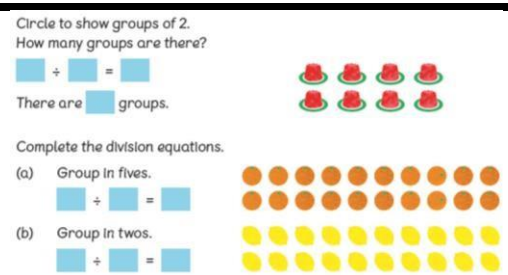
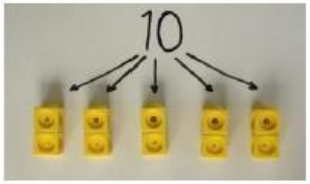
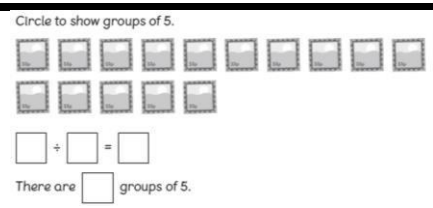
Strategies	Concrete →	Pictorial →	Abstract
Halving Halving will be introduced practically – showing children how to share something between 2 equally so that it is fair. this will initially be done with an apple or a pizza or a cake. Then an image of one. Then halving will be shown with numbers of things and sharing equally – 1 for you, 1 for you. With an emphasis that it must be fair.	  		In the early years children are not required to learn abstract forms of calculation methods. What is considered important at this stage is their understanding of the concepts and their practical application of these. They are encouraged to use their own method of recording their findings in whatever way they choose. They may however be taught abstract recording methods should they be ready.
Sharing equally Once the children have been taught to share equally between 2 then then learn to share equally between more friends.	  Problems could be something like, after a trip to the farm; The pigs all want apples and the farmer shares them out equally, how many apples does each pig get?		
Grouping things into 2s In reception the children begin to explore making groups of 2 and move onto exploring groups of bigger numbers.	 The children practice grouping things into 2s. Then we count how many pairs we have.  They get themselves into pairs.		At this point the children are exploring putting things into groups and counting how many groups they have they do not yet use the vocabulary or symbolism for division.
Exploring odds and evens The children begin to notice when a number can be put into groups of 2 and when there is 1 left over.	  The children are encouraged to notice which numbers are odd and which are even.	 The children look at how the odd and even numbers are distributed on a number line. They will begin to practice counting up and down in 2s with odd and even numbers.	At this point the children are exploring odd and even numbers, they do not yet use the vocabulary or symbolism for division.

Division expectations by the end of Reception:

- I can automatically recall halves up to half of 10 (without reference to rhymes, counting or other aids)
- I can explore and represent how quantities can be distributed equally.

Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

Division – calculation strategies introduced in Year 1:

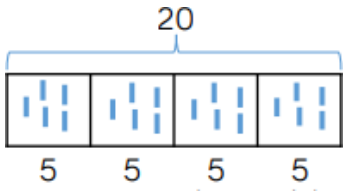
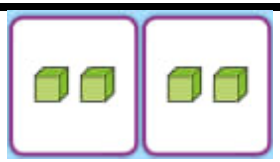
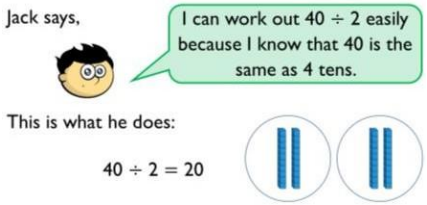
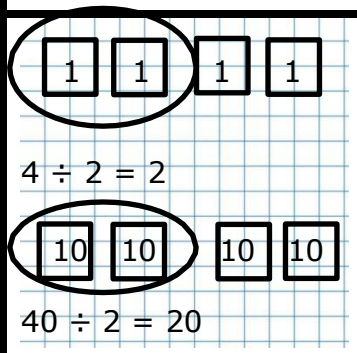
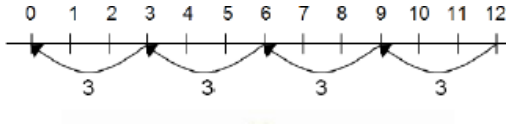
Strategies	Concrete →	Pictorial →	Abstract
Finding quarters			The children begin to understand that a quarter is half and half again and can to this with small numbers divisible be 4. Eg a quarter of 8. Half of 8 is 4 Half of 4 is 2
Arrays			The children use their knowledge of arrays to understand the relationship between multiplication and division and how you can divide in different ways: 8 ÷ 4 = 2 8 ÷ 2 = 4
Grouping	 Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.		The children can use their knowledge of multiplication and counting in groups to calculate divisions eg: 15 ÷ 5 - we know we counting in groups of 5 so we can count in groups of 5 till we reach 15 - 5, 10, 15. And we see there are 3; 15 ÷ 5 = 3

Division expectations by the end of Year 1:

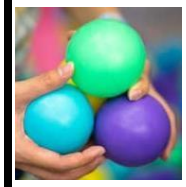
- I can use my knowledge of counting in 2s, 5s and 10s to solve division problems.

Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

Division – calculation strategies introduced in Year 2:

Strategies	Concrete →	Pictorial →	Abstract
Using the inverse	Pencils come in packs of 20 We need to put 5 in each pot. How many pots will we need? 5 10 15 20 		I know 5 X 4 =20 So I know 20 ÷ 5 = 4 And 20 ÷ 4 = 5
Applying knowledge of dividing smaller numbers to larger numbers	 4 ÷ 2 = 2 		I know 4 ÷ 2 = 2 So 40 ÷ 2 = 20
Division by repeated subtraction	12 ÷ 3 =		12 – 3 = 9 9 – 3 = 6 6 – 3 = 3 3 – 3 = 0

Minster Maths Vision - For all children to love maths and know they have the capacity to succeed.

	 Start with 12 objects and count how many sets of three you can take away before you get to 0. 		

Division expectations by the end of Year 2:

- I can recall and use division facts for the 2, 5 and 10 tables to solve simple problems, demonstrating an understanding of commutativity as necessary (e.g. knowing they can make 7 groups of 5 from 35 blocks and writing 35 ÷ 5 = 7; sharing 40 cherries between 10 people and writing 40 ÷ 10 = 4; stating the total value of six 5p coins).