

NORTH Stainley CHURCH OF ENGLAND PRIMARY SCHOOL

Maths Calculation Policy

Louise Wallen

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NORTH Stainley C OF E

PRIMARY SCHOOL

North Stainley

Ripon

HG4

North Yorkshire

HG4 3HT

01765 635276

admin@north

*We are our school, we have our roots and foundation in
love*



Our school is us, we will grow, blossom and flourish.

ATTAINMENT

GROWING

A child is beginning to demonstrate understanding of a concept. They remember facts about the objective and can recall them. They may begin to apply facts and rules linked to the objective but are not sufficiently confident to do this without prompting or may apply the facts in a basic or inconsistent way.

BLOSSOMING

A child is able to apply the necessary skills or knowledge in order to demonstrate that they have mastered a concept. They confidently meet the objective and demonstrate a full ability to apply the concept, facts, rules, or ideas involved. They are confident in summarising their approach and explaining their method to others.

FLOURISHING

A child exhibits a depth of learning related to the objective, can select this in different contexts and justify their choice to use the chosen skills. They evaluate when to prioritise the skill when confronted with routine or non-routine situations. They are able to revise what they know to create their own solutions and justify the rationale of their choice.

Maths Calculation Policy

The knowledge and understanding of mathematics has been developed over many centuries of time. Therefore time must be taken to develop a deeper knowledge, understanding, application and reasoning of mathematics in all children. Mathematics is an integral part of all our children's lives. We develop 'growth mind-sets' in mathematics, for adults and children; together creating enthusiastic and positive attitude that allows us to:

Grow our mathematical fundamental fluency and skills.

Blossom, whilst applying those skills to a variety of routine and non-routine mathematical problems.

Flourish when reasoning mathematically by following a line of enquiry, justifying and proving using mathematical language.

Grow, Blossom and Flourish; Mastery the North Rigton way....

- Children are encouraged by the belief that by working hard at maths they can succeed - 'everyone can do maths';
- Children are encouraged to peer assess and critique answers and strategies.

Typically, all children are taught at age related expectations at the same time, as part of a mixed age mastery class approach:

- Children are typically taught in mixed ability groups, supported by scaffolding, representations, manipulatives and precise questioning;
- All children have opportunity to explore concepts at a greater depth evidenced by outcome, more efficient strategies, greater reasoning and using a variety of methods to solve a problem.

Time spent on topics is flexible in order to allow all children to master concepts before moving onto the next part of the class' mathematical curriculum.

- If a child fails to grasp a concept or procedure, this is identified quickly and rapid intervention takes place.
- No child is allowed to be left behind.

All lessons are planned considering the 5 'Big Ideas' of Maths Mastery and using the Grow, Blossom and Flourishing methodology

Grow: Key and difficult points are included in a carefully sequenced journey through the learning in small steps;

Procedural fluency and conceptual fluency are developed in tandem;

Blossom: Intelligent practice reinforces both procedural fluency and conceptual fluency;

A variety of representations are used to support children's understanding;

Flourish: Connections with the maths are emphasised and children are encouraged to explain their reasoning using stem sentences and precise mathematical vocabulary.

Key facts are learnt to automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts:

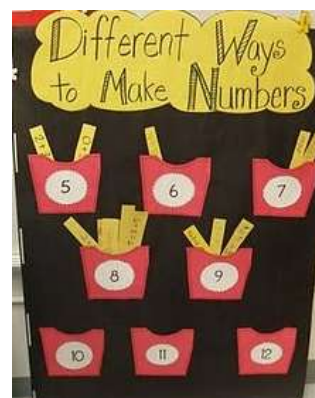
Key facts are developed to automaticity through practise at home and formative assessment at school.

Addition

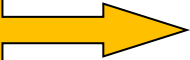
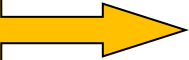
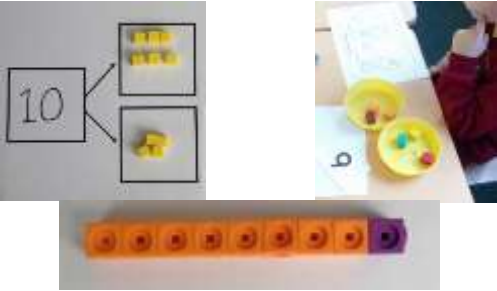
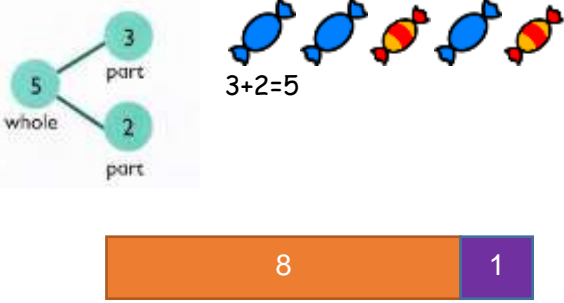

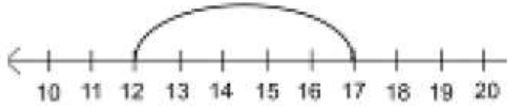
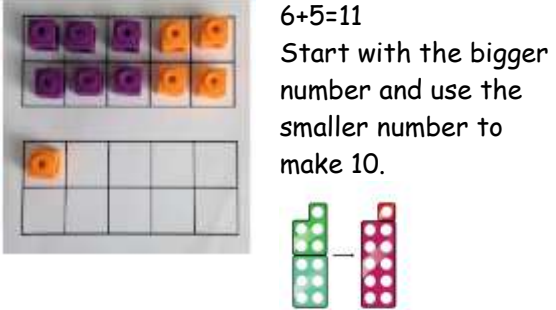
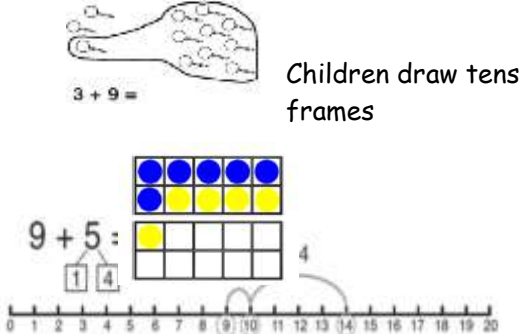
Early Years

Before addition can be introduced, children in Early Years build on concepts taught in Nursery by working through the number objectives in the 40 - 60 month band of Early Years Outcomes. 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 re-inforced 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 definition. 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 sums in the written form.



Key language – sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as',

Strategies	Concrete 	Pictorial 	Abstract
<p>Combining 2 groups to make a whole</p> <p>Counting sets of objects, combining then recounting using a 1:1 correspondence.</p>			<p>$4 + 3 = 7$</p> <p>I have 4 apples and 3 apples, how many apples do I have altogether?</p>
<p>Counting on using a numberline.</p> <p>Pupils should be taught to start at the biggest number and count on, using this as an opportunity to introduce the commutativity of addition.</p>			<p>$5 + 12 = 17$</p> <p>Reinforce starting from the largest number. $7 + 3 = 10$</p> <p>Encourage recall of known number facts to develop fluency in mental calculations.</p>
<p>Regrouping to make 10</p> <p>To move on from the previous strategy, rather than counting on, children use their number bond knowledge and bridge to 10 e.g. if $4 + 6 = 10$, so $4 + 7$ must equal 11.</p>		 <p>Children draw tens frames</p>	<p>$7p + 4p = 11p$</p> <p>I have 7p, how much more do I need to make 10p. How much more do I add on now?</p> <p>If you know $10=7+3$, what else do you know?</p> <p>Develop an understanding of equality $5 + 5 = 7 + 3$</p>

Adding 3 single digits

Use this method as an opportunity to develop fluent recall and application of known number facts including bonds and doubles.



Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.



$$6 + 3 + 4 = 13$$

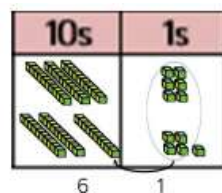
$$\begin{array}{r} 4 + 7 + 6 = 10 + 7 \\ = 17 \end{array}$$

Partitioning to add including formal column addition.

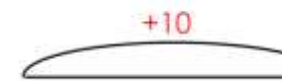
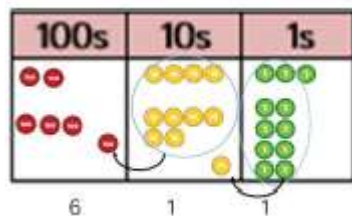
The emphasis for this strategy in KS1 is to develop a deep understanding of place value.

In year 2, recording addition and subtraction informally in columns supports place value and prepares for formal written methods with larger numbers later on in KS2. Ensure that when moving into any form of column the ones are calculated first.

Continue to develop understanding of partitioning and place value using arrow cards and base 10



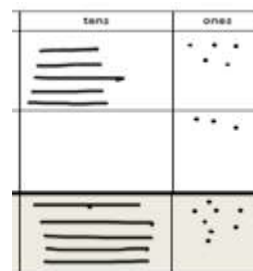
Use place value chart and counters



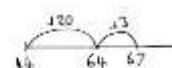
22

$$22 + 17 = 39$$

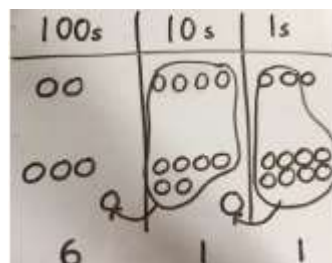
Use a numberline and progress to more efficient jumps.



$$44 + 23 = 67$$



Children to represent the base 10 in a place value chart



$$25 + 48 = 73$$

$$20 + 5$$

$$40 + 8$$

$$60 + 13 = 73$$

Informal expanded recording in columns

Formal column method to be used whilst continuing to emphasise place value of digits:

243

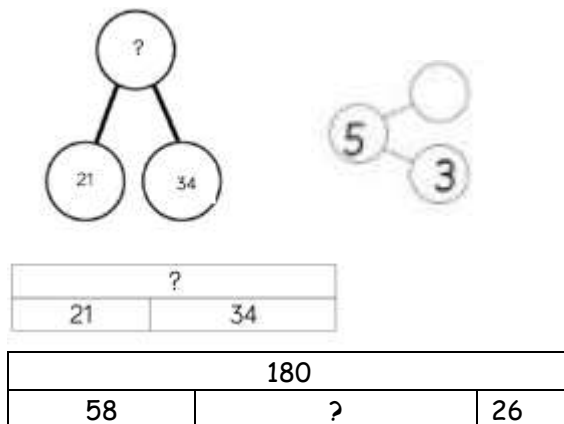
+368

611

11

Conceptual variation

Children should be exposed to a variety of part part whole models. The different structures of augmentation (quantity is increased) and aggregation (combine 2 quantities to make a whole) should be taught. Consideration should be given to the critical features of the concept, what it is and is not as well as misconceptions.



Word problems

Augmentation - Jane has 6 chicks in her classroom and 3 more chicks hatch out of their eggs. How many chick does she now have ?

Aggregation - in year 3 there are 21 children and in year 4 there are 34 children. How many children are there in total ?

Missing number problems

$$\begin{array}{r} 21 \\ +34 \\ \hline \end{array}$$

$21 + 34 =$

$\square = 21 + 34$

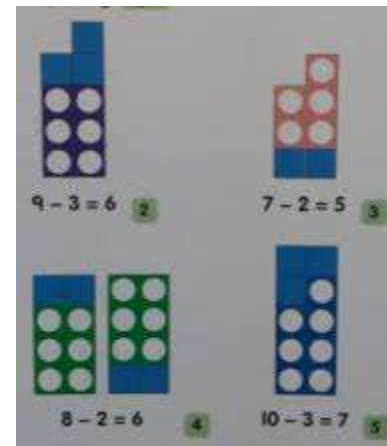
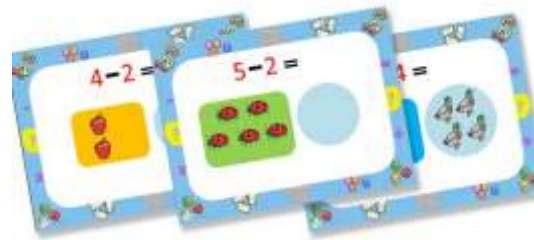
$$\begin{array}{r} 3 \ 7 \\ + \ 2 \ 4 \ 3 \\ \hline 8 \ 2 \ 2 \end{array}$$

10s	1s
● ●	●
● ● ●	?
?	5

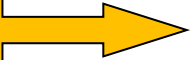
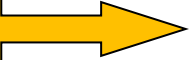





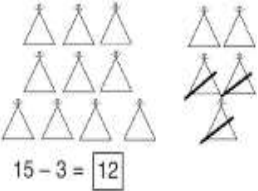

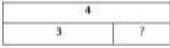
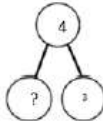

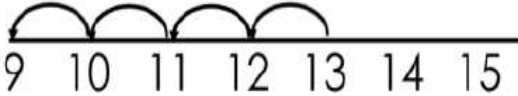
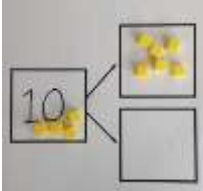

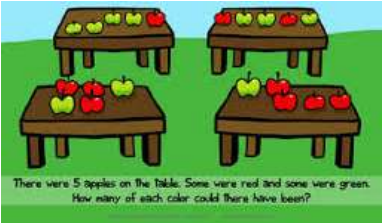
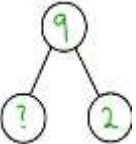
Subtraction

Early Years

Before subtraction can be introduced, children in Early Years build on concepts taught in Nursery by working through the number objectives in the 40 - 60 month band of Early Years Outcomes. 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 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 less 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 5 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.

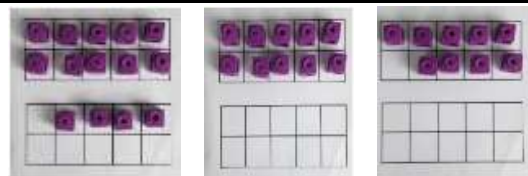


Key language - take away, less than, difference, subtract, minus, fewer, decrease,

Strategies	Concrete 	Pictorial 	Abstract
<p>Taking away ones Use physical objects to demonstrate how something can be taken away. Move on to crossing out drawn representations. This can be developed by representing a group of ten with a line and ones with dots.</p>	  	    <p>The bar model also to be used.</p>	<p>$4 - 3 = ?$</p> <p>$? = 4 - 3$</p>   <p>There are 15 cakes in the shop. One cake is eaten, how many are left?</p>
<p>Counting back As with the previous, this strategy is used for subtracting small numbers from larger numbers and provides a good foundation for the concept of subtraction</p>	 <p>Use counters or objects and move them away from the group as they are counted.</p>	 <p>$13 - 4 = 9$</p>	<p>Put 17 in your head, count back 5. What number are you at? Use your fingers to help.</p>
<p>Part, part, whole model This model develops knowledge of the inverse relationship between addition and subtraction and is used to find the answer to missing number problems.</p>	 <p>If 10 is the whole and 6 is one of the parts. What is the other part?</p>  <p>If 12 is the whole and 4 is one part, what is the other part?</p>	 <p>There were 5 apples on the table. Some were red and some were green. How many of each color could there have been?</p>	<p>I made 9 buns for the cake sale and I only had 2 left at the end. How many did I sell?</p> <p>Children should be taught the skills to approach problems in a systematic way.</p>  <p>$9 - 2 = ?$</p>

Make 10

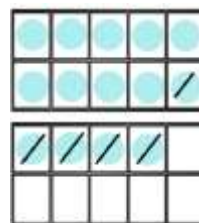
Use this strategy to subtract a single digit number from a 2-digit number. Pupils identify how many need to be taken away to make ten first. Then they take away the rest to reach the answer.



$$14-5=9$$

Make 14 on the ten frame or with different coloured cubes to represent the ten and the ones. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.

$$13-7=6$$



$$15-7=$$

How many do we subtract to reach the next 10?

How many do we have left to subtract?

Children to show how they can make 10 by partitioning the subtrahend.

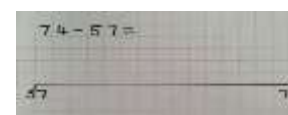
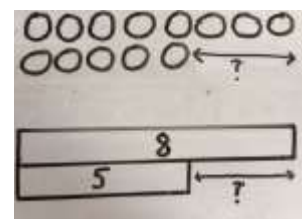
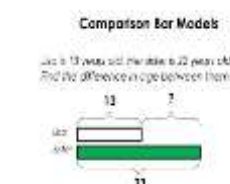
$$14-5=9$$
$$14-4=10$$
$$10-1=9$$

Find the difference

Pupils should develop a good understanding of the meaning of 'difference', exploring the inverse relationship with addition by counting back and counting up.



Practical resources to visualise 'difference' and recognise inverse relationships e.g. $12-1=11$ and $11+1=12$



Use a blank number line to count back and count up between 2 numbers, encouraging use of complements to develop efficiency.

Jake has 5 more strawberries than Lexie. Jake has 11 cherries. How many does Lexie have?

Look at the graph. Fewer children have green eyes than blue. What is the difference?

Children to explore why $9-6=8-5=7-4$ have the same difference.

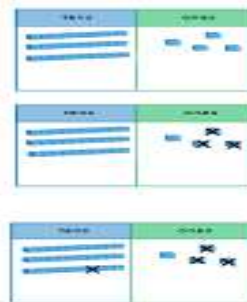
Partitioning to subtract

The emphasis for this strategy in KS1 is to develop a deep understanding of place value.

When not regrouping, partitioning should be developed as a mental strategy rather than formal recording in columns.



$$34-13=21$$



$47 - 23 = 24$ Partition the second number and subtract it in tens and units, as below:



Move towards more efficient jumps block, as below:

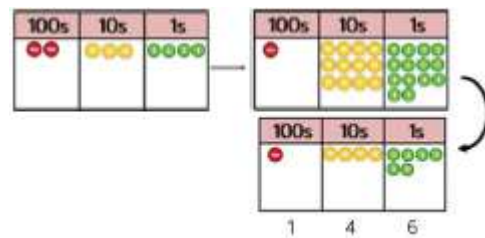
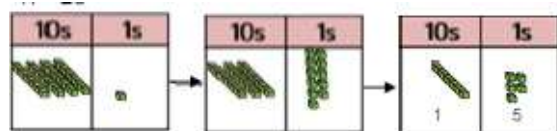


There are 35 children in the class and 12 are boys. How many are girls?

$$35-12=$$

Column Method

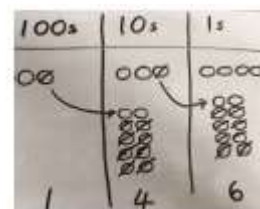
Use column method with base 10, exchange where necessary, moving to place value counters on a place value chart



Represent the base 10 pictorially remembering to show the exchange.



Represent the place value counters pictorially remembering to show what has been exchanged.



Expanded methods used to develop the concept of exchanging, in this example the 40, for four tens (30) and ten ones, is important to understanding the decomposition in vertical subtraction. Children must understand that when they have exchanged the 10 they still have 41 because $41 = 30 + 11$

$$\begin{array}{r} 30 + 11 \\ 41 + 10 + 1 \\ 20 + 6 \\ 10 + 5 \end{array} \quad \begin{array}{r} 341 \\ - 26 \\ \hline 15 \end{array}$$

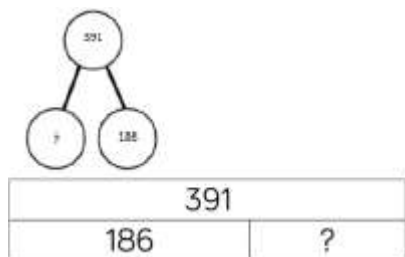
Children must understand what has happened when they have crossed out digits when moving towards the condensed method for column subtraction.

$$\begin{array}{r} 234 \\ - 88 \\ \hline 146 \end{array}$$

Conceptual Variation

In general discussion, the operation should be referred to as 'subtraction' not take away. Children should be exposed to the different structures of subtraction; take away, difference, partition.

different ways to solve $391 - 186$



$$\square = 391 - 186$$

$$\begin{array}{r} 391 \\ -186 \\ \hline \end{array}$$

What is 186 less than 391?

Missing digit calculations

$$\begin{array}{r} 39\square \\ - \square\square6 \\ \hline \square05 \end{array}$$

Ben spent £391, Tom spent £186. How much more did Ben spend?



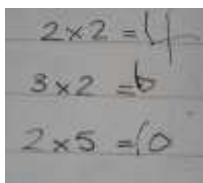
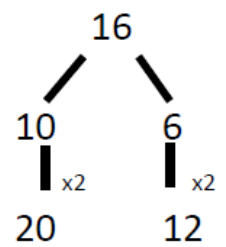
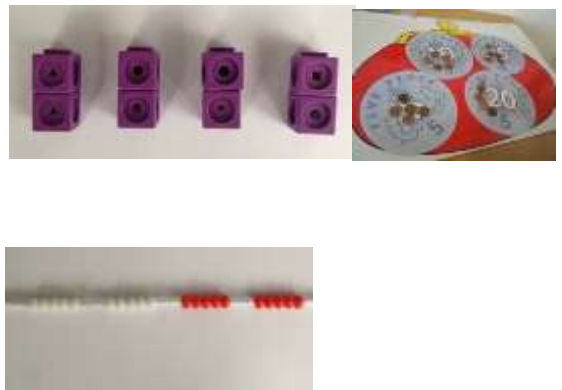
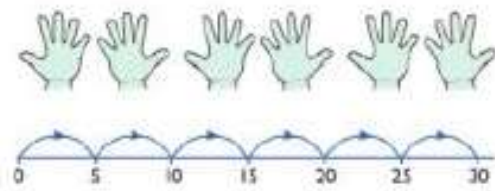
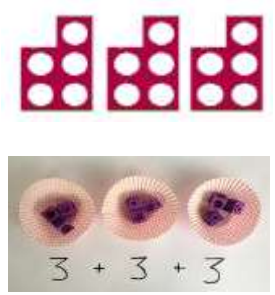
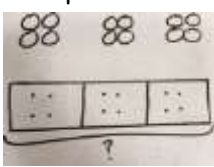
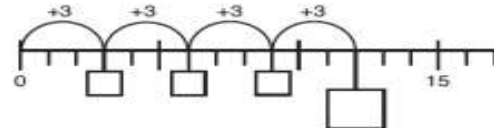

Multiplication

Early Years

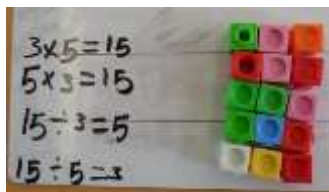
By the end of Early Years, children are expected to understand the concept of doubling and to be able to double a number up to 10. Before doubling can be introduced, children need to have a secure knowledge of counting, number facts and addition in order to double. Children are then introduced to the 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.



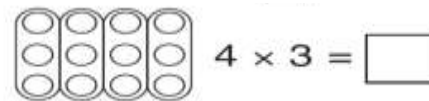
Key language – double, times, multiplied by, multiple, repeated addition, the product of groups, lots of, equal groups, factor, product

Strategies	Concrete	Pictorial	Abstract
<p>Doubling</p> <p>Pupils should be encouraged to develop fluent mental recall of doubles and relate to the 2 x table.</p>		<p>Double 4 is 8</p> 	  <p>If I can see 10 wheels, how many bikes are there?</p>
<p>Counting in multiples</p> <p>Pupils can use their fingers as they are skip counting, to develop an understanding of 'groups of'. Children should become increasingly fluent as they practise.</p>		<p>Use a number line or pictures to continue support in counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers and work out missing numbers in sequences both forward and backward.</p> <p>If I count in 2's will I get to the number 58?</p>
<p>Repeated addition</p> <p>Pupils should apply skip counting to help find the totals of repeated additions.</p>	 <p>$5+5+5=15$</p> <p>$3+3+3=9$</p>	<p>Pupils begin to recognise the relationship between repeated addition and multiplication.</p>  <p>$4+4+4=12$ $3 \times 4 = 12$</p> 	<p>Write addition or multiplication sentences to describe objects and pictures.</p>  <p>$2+2+2+2+2=10$ $2 \times 5 = 10$</p>

Pupils should understand that arrays can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.



Draw arrays in different rotations to find **commutative** multiplication sentences.



Children should show the size of the group by circling, e.g. $10 \times 5 = 50$
 $5 \times 10 = 50$

3 children go to the park to hunt for pine cones. They find 5 each, how many do they find altogether?

5 children eat the same number of cakes at a party. 15 cakes are eaten in total, how many did they each eat?

$5+5+5=15$

$3 \times 5 = 15$

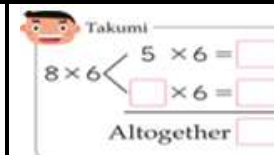
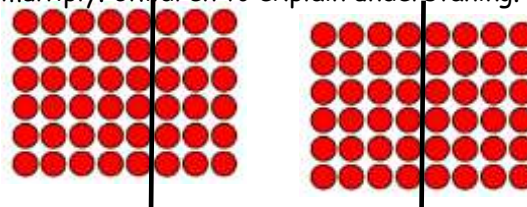
$$3+3+3+3+3=15$$

$5 \times 3 = 15$

Using counters to show 6×4 is equal to 5×4 plus 1×4



Children to represent the counters pictorially, showing different ways to multiply. Children to explain understanding.

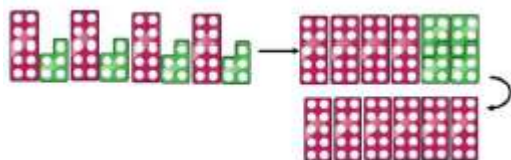


$$8 \times 6 = 4 \times 6 + 4 \times 6$$

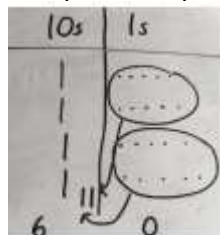
$$8 \times 6 = 2 \times 4 \times 6$$

Partition to multiply.

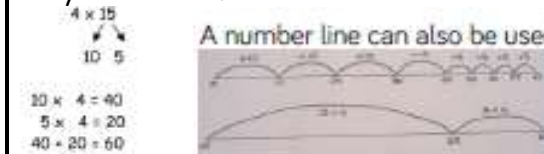
Using Numicon or base 10.



Children to represent the concrete manipulatives pictorially.



Children to be encouraged to show the steps they have taken.



Children are then introduced to the more formal recording using the Grid method for multiplying:

$$62 \times 38 = 2356$$

$$62 \times 38 = 2356$$

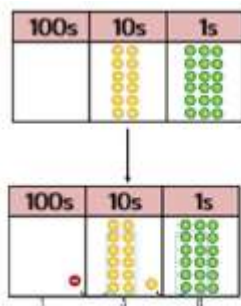
$$345 \times 6 = 2070$$

x	300	40	5	
6	1800	240	30	= 2070

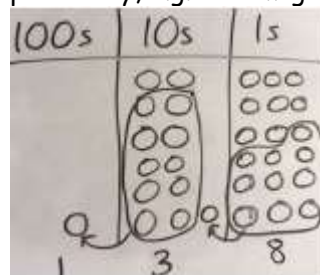
x	60	2	
30	1800	60	= 1860
8	480	16	= 496
			<u>2356</u>

Formal Written Method
Short and Long
Multiplication

Using place value counters or base 10, e.g. 6×23



Children to represent the counters/ base 10 pictorially, e.g. the image below.



Expanded method

$$\begin{array}{r} 23 \\ \times 6 \\ \hline 18 \quad (6 \times 3) \\ 120 \quad (6 \times 20) \\ \hline 138 \end{array}$$

Formal written method of short and long multiplication:

$$\begin{array}{r} 6 \times 23 = \\ 23 \\ \times 6 \\ \hline 138 \end{array}$$

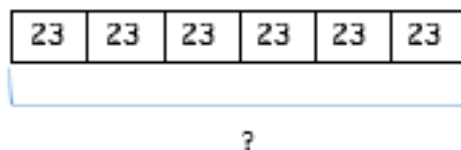
$$\begin{array}{r} 194 \\ \times 26 \\ \hline 1164 \\ 3880 \\ \hline 5044 \end{array}$$

When children start to multiply $2d \times 2d$ and $3d \times 2d$ they should be confident with the abstract.

Conceptual variation



Different ways to ask children to solve 6×23



Mai had to swim 23 lengths, 6 times a week.
How many lengths did she swim in one week?

With the counters, prove that $6 \times 23 = 138$

Find the product of 6 and 23

$$6 \times 23 =$$

$$\square = 6 \times 23$$

$$\begin{array}{r} 6 \quad 23 \\ \times 23 \quad \times 6 \\ \hline \end{array}$$

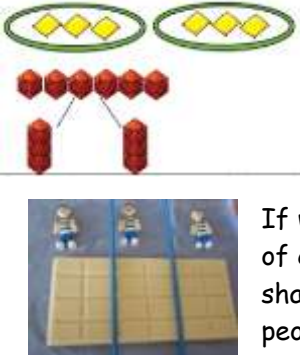
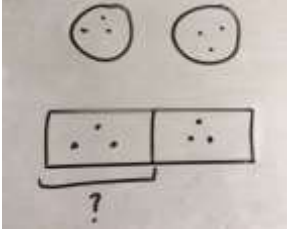

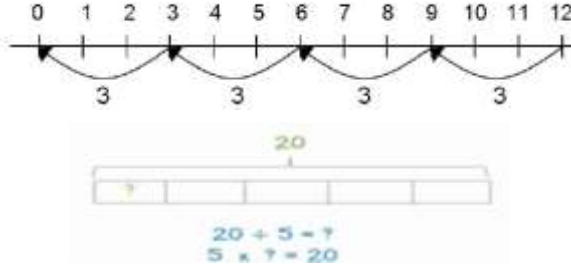
Division

Early Years

By the end of Early Years, 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, 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.



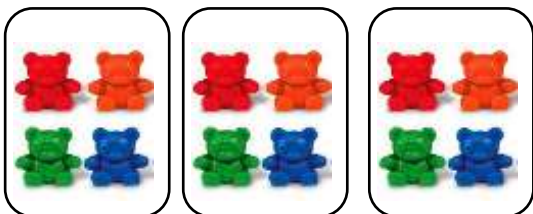
Key language – share, group, divide, divided by, half, dividend, divisor, quotient

Strategies	Concrete	Pictorial	Abstract
<p>Sharing Here, division is shown as sharing.</p>	<p>Explore sharing using a range of objects</p>  <p>$6 \div 2 = 3$</p> <p>If we have 24 squares of chocolate and we share them between 3 people, each person will have 8 squares each.</p>	<p>Children should represent the sharing pictorially.</p> 	<p>Share 6 buns between two people.</p> <p>$6 \div 2 = 3$</p> <p>Can you make up your own 'sharing' story and record a matching equation?</p>
<p>Division as grouping Here, division is shown as grouping. This is a good opportunity to demonstrate and reinforce the inverse relationship with multiplication.</p>	 <p>If we have ten cubes and put them into groups of two, there are 5 groups.</p> <p>Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.</p>	<p>Show jumps in groups. The number of jumps equals the number of groups.</p>  <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group?</p> <p>Max is filling party bags with sweets. He has 20 sweets altogether and decides to put 5 in every bag. How many bags can he fill?</p>

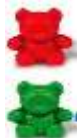
Division with a remainder

This strategy provides an opportunity to reinforce prior learning of odd and even and 'multiples' when exploring how numbers can and cannot be divided into different whole numbers.

Divide objects between groups and see how many are left over.

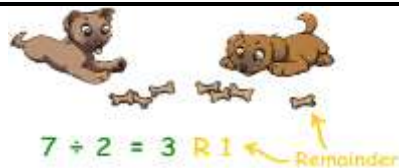


$$14 \div 3 =$$



$$13 \div 4$$

Use of lollipop sticks to form whole-squares are made because we are dividing by 4. There are 3 whole squares, with 1 left over.



$$7 \div 2 = 3 \text{ R } 1$$

Remainder



remainder 2



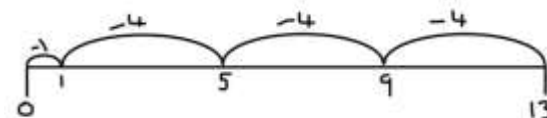
Complete written divisions and show the remainder using r.

$$29 \div 8 = 3 \text{ REMAINDER } 5$$

dividend divisor quotient remainder

$$13 \div 4 = 3 \text{ remainder } 1$$

Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line. '3 groups of 4, with 1 left over'



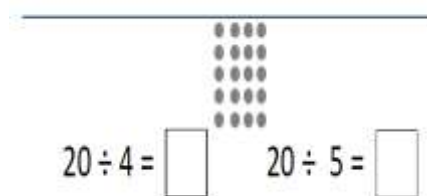
Division within arrays

Use arrays of concrete manipulatives and images of familiar objects to find division equations.



Begin to use dot arrays to develop a more abstract concept of division.

Write the division equations that the array represents.



Children to draw lines to divide their array

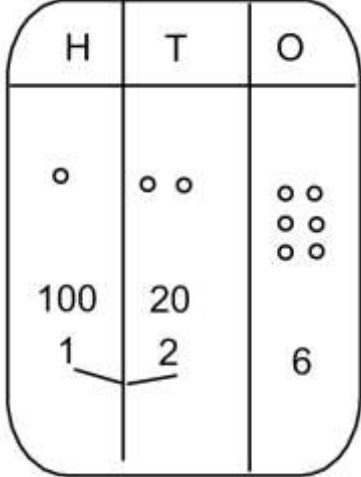
Find the inverse of multiplication and division sentences by creating four linking number sentences.

$$5 \times 4 = 20$$

$$4 \times 5 = 20$$

$$20 \div 5 = 4$$

$$20 \div 4 = 5$$

<p>Partitioning using known facts</p>		 <p> $126 \div 6 = ?$ $(12 \div 6 = 2)$ $120 \div 6 = 20$ $6 \div 6 = 1$ $20 + 1 = 21$ </p>	<p>When children are secure with known facts and place value they are encouraged to use the formal written method.....</p> <p> $126 \div 6 =$ $\underline{120} \div 6 = \underline{20}$ $6 \div 6 = 1$ </p> <p style="text-align: right;">$20 + 1 = 21$</p>
<p>Long Division (Bus stop)</p>		<p>In upper Key Stage Two, when children are secure with using 'chunking' to solve division calculations, they are encouraged to use their understanding of number facts and place value to subtract the most efficient chunks in the formal written method of long division:</p> <p> $\begin{array}{r} 3 \overline{) 547} \\ \underline{300} \text{ (100x)} \\ 247 \\ \underline{240} \text{ (80x)} \\ 7 \\ \underline{6} \text{ (2x)} \\ 1 \end{array}$ </p> <p style="text-align: right;">Answer = 182 remainder 1</p>	
<p>Short Division (Bus stop)</p>		<p>It is important that children are confident and accurate using this method to divide 3-digit and 4-digit numbers by a single digit before moving onto the formal written method of short division, which requires them to internalise the working above.</p>	

<p>Bus Stop and Double Decker method.</p>		<div> <div> $\begin{array}{r} 182 \text{ r}1 \\ 3 \overline{) 547} \end{array}$ </div> <div> $\begin{array}{r} 068.375 \\ 8 \overline{) 5467.306040} \end{array}$ </div> </div> <p>Take the 2 digit divisor and divide by the factor pairs- So the number $10134 \div 18$ would be divided first by 3 then 6 (or 9 and 2 – either pair of factors which multiplied gives the product 18!)</p> <div> <div> $\begin{array}{r} 563 \\ 6 \overline{) 3378} \end{array}$ </div> <div> $\begin{array}{r} 563 \\ 3 \overline{) 10134} \end{array}$ </div> </div>
<h1>Conceptual Variation</h1>		
<p>Children should be exposed to both grouping and sharing when being introduced to division. They should also solve problems within a context and think about what any remainder means for that context: does the answer need to be rounded up/down or be given as a decimal or fraction?</p>	<div> <h2>Different ways to ask children to solve $614 \div 5$</h2> <p>I have £614 and share it equally between 5 bank accounts. How much will be in each account?</p> <p>614 pupils need to be put into 5 groups. How many will be in each group?</p> <p>614 pupils need to be put into groups of 5. How many groups will be needed?</p> <p>$614 \div 5 = ?$</p> <p>$? = 614 \div 5$</p> <p>$5 \overline{) 614}$</p> </div>	

Key language	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as',	<ul style="list-style-type: none"> Combining 2 groups to make a whole. Counting on using a number line. 	<ul style="list-style-type: none"> Regrouping to make 10. 	<ul style="list-style-type: none"> Adding 3 single digits. Partition to add including formal column addition. 	<ul style="list-style-type: none"> Partition to add including formal column addition (up to 3 digits) 	<ul style="list-style-type: none"> Partition to add including formal column addition (up to 4 digits). 	<ul style="list-style-type: none"> Partition to add including formal column addition (more than 4 digits). 	<ul style="list-style-type: none"> Partition to add including formal column addition (up to 3 decimal places).
Subtraction take away, less than, difference, subtract, minus, fewer, decrease,	<ul style="list-style-type: none"> Taking away ones. Counting back. Part-Part-Whole. Finding the difference. 	<ul style="list-style-type: none"> Regrouping to make 10. Number line to find the difference 	<ul style="list-style-type: none"> Number line to find the difference Partition to subtract. Column subtraction. 	<ul style="list-style-type: none"> Number line to find the difference Column subtraction (up to 3 digits). 	<ul style="list-style-type: none"> Number line to find the difference Column subtraction (up to 4 digits). 	<ul style="list-style-type: none"> Column subtraction (more than 4 digits). 	<ul style="list-style-type: none"> Column subtraction (up to 3 decimal places).
Multiplication double, times, multiplied by, multiple, repeated addition, the product of groups, lots of, equal groups, factor, product	<ul style="list-style-type: none"> Doubling. Counting in multiples. Repeated addition. 	<ul style="list-style-type: none"> Arrays showing commutative multiplication. 		<ul style="list-style-type: none"> Distributive law of multiplication using arrays. Partition to multiply (Expanded method: two-digit numbers times one-digit numbers). Formal short multiplication using known facts 	<ul style="list-style-type: none"> Partition to multiply (Expanded method: two- and three-digit numbers times by one-digit numbers). Formal short multiplication using known facts 	<ul style="list-style-type: none"> Formal written method (short multiplication: up to 4 digits by a one- digit number) 	<ul style="list-style-type: none"> Formal written method (short multiplication of one-digit numbers with up to 2 decimal places by whole numbers; long multiplication - up to 4 digits by two-digit numbers)
Division share, group, divide, divided by, half, dividend,	<ul style="list-style-type: none"> Sharing. Division as grouping. Division with a remainder. 		<ul style="list-style-type: none"> Division within arrays. 			<ul style="list-style-type: none"> Formal written method (Long division: up to four-digit numbers by a 	<ul style="list-style-type: none"> Formal written method (Long division and short division: up to 4 digits by a two-digit whole

divisor, quotient						one-digit number)	number; written methods with answers up to 2 decimal places). • Bus stop method for non-prime
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