

# North Park Primary School



## Calculation Policy

# **EARLY YEARS**

# EYFS Addition

Early learning goals:

- Count reliably with numbers from 1 to 20, place them in order.
- Say which number is one more than a given number.

Using quantities and objects, they add two single-digit numbers and count on to find the answer.

**Recognise numbers up to 20 and understand the meaning of each number by recognising and knowing their clusters**

**Count on in ones and say which number is one more than a given number using a number line or number track to 20.**

**Begin to relate addition to combining two groups of objects using practical resources, role play, stories and songs.**

'Numberblocks' are introduced to allow children to see the formation of each number, as well as the amount of blocks each number represents. Each number has its own song and story.



Children will be exposed to lots of different representations of numbers, including Numicon. They will begin by counting identical objects before moving onto counting objects that have slight differences. At the early stage, they are not expected to write the numerals but are encouraged to make drawings and jottings.



**Counting to up to 10:** The five frame is used to support children in lining up objects to count. It will also support children to subitise numbers within 5. They will then be introduced to the 10 frame to help them subitise larger

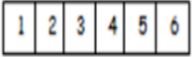
Numicon shapes are introduced to:

- identify 1 more/less
- combine pieces to add
- find number bonds
- add without counting

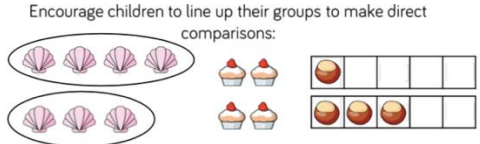


Number tracks can be introduced to count up on and to find one more:

What is 1 more than 4?  
1 more than 13?

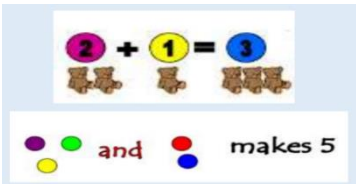


Children will line up their groups of objects to make direct comparisons. This will give children opportunities to count two sets of identical objects and compare them.



e.g.

-How many \_\_\_ are there in this group? -How many \_\_\_ are there in this group -Which group has more? Which group has fewer?

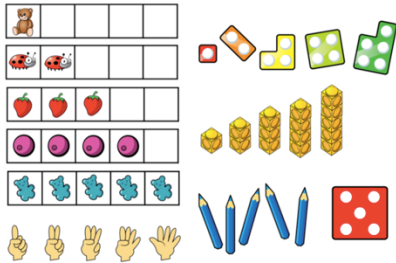


Children can then begin to combine groups of objects using concrete apparatus and in their outdoor and small world areas

such as counting leaves and pebbles.

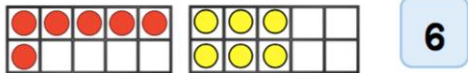
They will repeat these activities using non-identical objects

quantities and explore the 5-and-a-bit structure and the



pair structure e.g.

they will see 6 as five and one more or 3 pairs of 2.

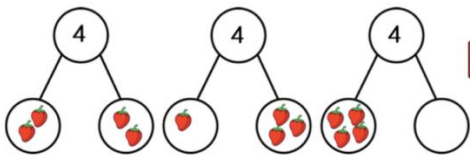


10 frames will also be used when learning number bonds to 10, counting to 10 (and then 20) alongside other visual representations such as bead strings.

Provide the children with a selection of beads and pieces of string.  
Encourage them to make their own bead strings using 10 beads.



Part-whole models will be used to explore the number bonds which make any given number.



### Counting to 20

Children are introduced to numbers up to 20 using the same resources used for numbers up to 10.

Ask children to make a number on a five frame.

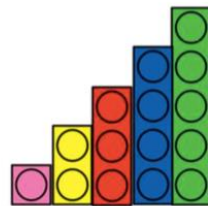


Can you show me one more?

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?

When playing with construction materials, the children can build staircases. The children will be encouraged to look at each step and see how many blocks they go up by each time.

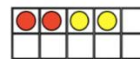
First, then stories will be practise more in real contexts:



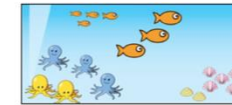
now used to adding life



First there were 2 people on the bus.  
Then 2 more people got on the bus.  
Now there are 4 people on the bus.



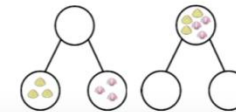
and eventually relate it to the part-whole model e.g.:



What can you see in the picture?

How many big fish can you see? How many small fish?  
How many fish altogether?  
How many yellow shells? How many pink shells?  
How many shells altogether?  
I spy a group of 3 and a group of 2. What am I looking at?

What is the same? What is different?



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Construct number sentences verbally or using cards to go with practical activities.

Children are encouraged to read number sentences aloud in different ways:

- "Three add two equals 5"
- "5 is equal to three and two"
- "5 is the same as three and two"

Children make a record in pictures, words or symbols of addition activities.

**Example of songs for counting up to 5:**

Five little speckled frogs

Five currant buns

(There are a number of songs that count back one each time highlighting the one less pattern)

Five little ducks- Denise Fleming

Five tiddly widdy tadpoles- Debbie Tarbett

Five little monkeys jumping on the bed- Eileen

Christelow

## EYFS Subtraction

Early learning goals:

- Say which number is one less than a given number.

Using quantities and objects, they subtract two single-digit numbers and count back to find the answer.

**Say which number is one less than a given number using a number line or number track to 20.**

**Begin to count backwards in familiar contexts such as number rhymes or stories.**

**Begin to relate subtraction to 'taking away' using concrete objects and role play.**

Number tracks can be introduced to count back and to find one less:  
 What is 1 less than 9?  
 1 less than 20?



Children will use five frames to count back.

Play a game of musical chairs with a group of up to 5 children. Start with 5 chairs. What happens each time the music stops? How many chairs do we have now? Are there enough chairs for each person? Each time the music stops, ask the children to say how many chairs are left.



Concrete apparatus is used to relate subtraction to taking away and counting how many objects are left. Concrete apparatus models the subtraction of 2 objects from a set of 5.



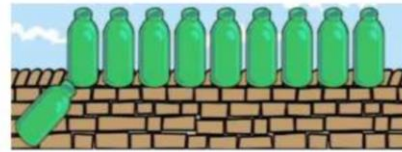
Three teddies take away two teddies leaves one teddy

Construct number sentences verbally or using cards to go with practical activities.

● ● ● ● ~~●~~      $5 - 1 = 4$

### Water

Provide 5 ducks, fish or frogs to encourage children to act out the songs you have been singing this week. Use five frames on shelves to encourage children to count the animals back on to the five frame and to be able to see if there are less animals than there should be.



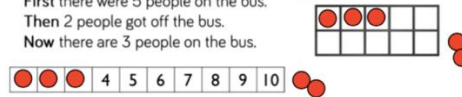
10 Green Bottles sitting on the wall ...



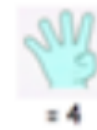
First, then now stories will be used to practise taking away in real life contexts:



First there were 5 people on the bus.  
Then 2 people got off the bus.  
Now there are 3 people on the bus.



Children are encouraged to read sentences aloud in different ways "five subtract one leaves four" "four is equal to five subtract one" "four is the same as five subtract one" Solve simple problems using fingers



## EYFS Multiplication and Division

Early learning goals:

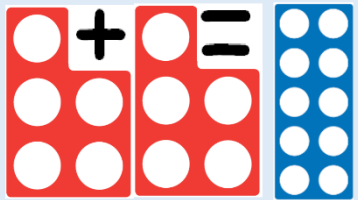
- They solve problems, including doubling, halving and sharing

They solve problems, including halving and sharing.

Use pictorial representations and concrete resources to double numbers to 10.

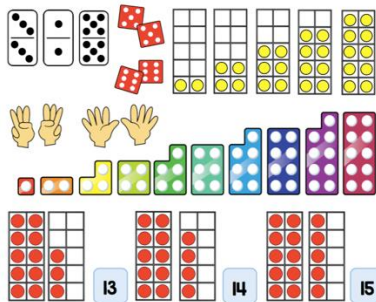
Use pictorial representations and concrete resources to halve numbers to 10.

Begin to share quantities using practical resources, role play, stories and songs.



The link between

addition and multiplication can be introduced through doubling. Domino and dice games can be used to do this as well as fingers. Representing the even number pair-wise on 10 frames supports the children to make the link between doubling and halving. They can also be used to illustrate the odd and even patterns of numbers.



Children will be introduced to halving using real life scenarios and objects e.g.:

Show the children a bowl of strawberries. Explain that you are going to share them into 2 equal groups so there will be half for you and half for your friend. Put a handful straight onto each plate without counting – make sure that one plate has much more strawberries than the other. Ask the children if that is fair. Prompt them to show you how to share the strawberries fairly.

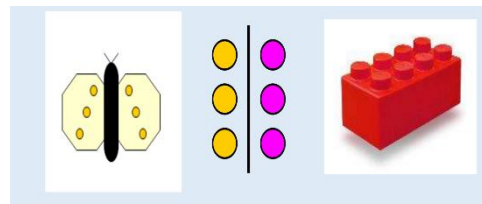


“I have got a sandwich to share between two people. Can you cut the sandwich



share in half?”

Children have a go at recording the calculation that has been carried out: e.g. by drawing pictures in groups or by arranging concrete apparatus



Once children can confidently have they can explore sharing between 3 or 4 people.

Children will be provided with opportunities to share quantities into groups fairly e.g. sharing out cards or dominoes at the start of a game.



### Teddy bear picnic



Provide 2 teddy bears, 2 plates and small even quantities of loose parts to represent different food items.

Ask the children to share out the loose parts fairly so that each teddy gets the same. What will happen if another teddy joins the picnic?

**Key Stage 1 and 2**

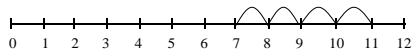






**Pictorial**- Start at the larger number on the number line and count on in ones or in one jump to find the answer.

7+4



**Abstract**- Place the larger number in your head and count on in the smaller number to find the answer e.g. 5+12=17.

**Regrouping to make 10 using ten frame:**

**Concrete**- Start with the bigger number and use the small number to make 10 e.g. 6 +5= 11

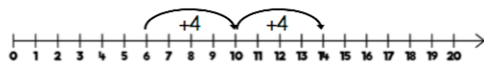


**Pictorial**- Use pictures or a number line. Regroup or partition the smaller number using the part whole model to make 10.

'Mo has used a number line to calculate 6 + 8

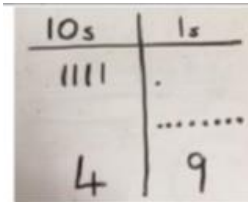


I partitioned 8 into 4 and 4 to make it easier.

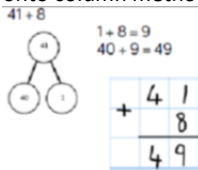


**Abstract**-

**Pictorial**-Children to represent the base 10 as symbols.



**Abstract**-Part-whole model which eventually leads onto column method.

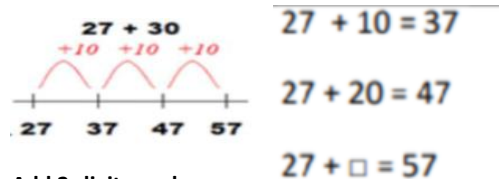


**Add a 2-digit number and tens**

**Concrete**- Explore the fact that the ones digit does not change.



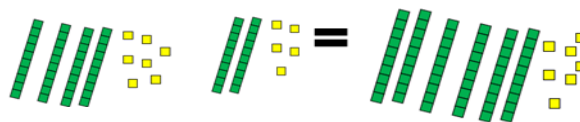
**Abstract**-



**Add 2-digit numbers**

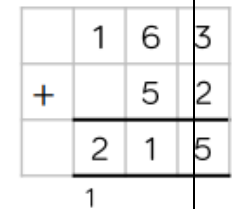
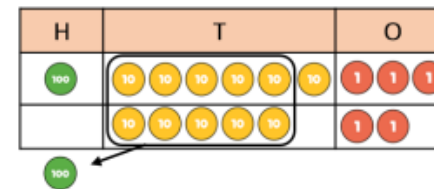
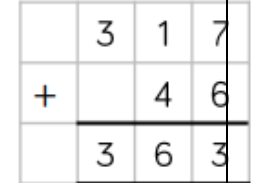
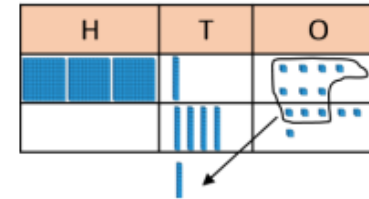
**Concrete**-

47+25=  
47 + 25 = 72

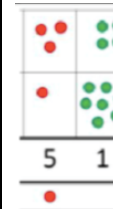


Children work towards using column method (abstract):  
E.g. 28+7=

**Concrete**- Introduce column addition modelled with place value counters or Dienes. They will be introduced to regrouping.



**Pictorial**-Children can draw a representation of the grid to further support their understanding, carrying the ten underneath the line.



**Abstract**-Start by partitioning the numbers before using the formal column method, to show the exchange.

20 + 5  
40 + 8  
60 + 13 = 73

$7+4=11$

If I am at seven, how many more do I need to make 10?  
 How many more do I need to add on now?

**Represent & use number bonds and related subtraction facts within 20**

**Concrete-**



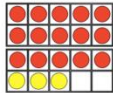
2 more than 5

**Pictorial/Abstract-** Which number bond is represented in the picture?

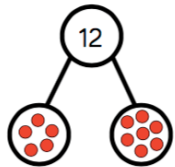


There are \_\_\_ red counters.  
 There are \_\_\_ blue counters.  
 Altogether there are \_\_\_ counters.  
 \_\_\_ + \_\_\_ = \_\_\_    \_\_\_ + \_\_\_ = \_\_\_

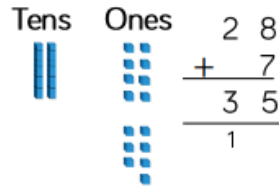
Circle the addition and subtraction number sentences that match the ten frames.



- $15 + 3 = 18$        $15 - 3 = 18$
- $3 + 18 = 15$        $18 - 15 = 3$
- $18 + 3 = 15$        $18 - 3 = 15$
- $18 = 3 + 15$        $15 - 18 = 3$

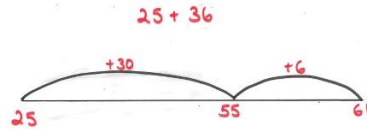


- $12 = 12 + 0$
- $12 = 11 + \underline{\quad}$
- $12 = 10 + \underline{\quad}$

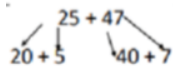


**Abstract-**

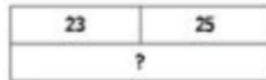
Use a number line and bridge ten where necessary.



Use part-whole/bar models where necessary.



- $20 + 40 = 60$
- $5 + 7 = 12$
- $60 + 12 = 72$



$23 + 25 = 48$

$$\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$$

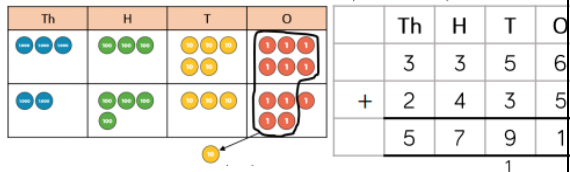
## Year 4

Column method-regrouping, use of place value counters for adding decimals.

**Column method- regrouping (up to 4 digits).**

**Concrete-** Children continue to use base 10 or place value counters to add, exchanging 10 ones for a ten, 10 tens for a hundred, etc.

**Pictorial-** Draw representations using a place value grid, which will then lead to column method.



**Abstract-** Continue from previous work to carry hundreds as well as tens. Relate to money and measures.

789 + 642 becomes

$$\begin{array}{r}
 789 \\
 + 642 \\
 \hline
 1431 \\
 \small 1 \quad 1
 \end{array}$$

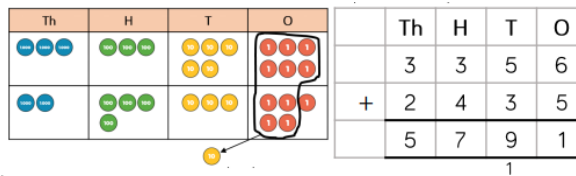
Answer: 1431

## Year 5

Column method- regrouping, use of place value counters for adding decimals.

**Column method-regrouping (progressing to more than 4-digits)**

**Concrete-** Children continue to use base 10 or place value counters to add, exchanging 10 ones for a ten, 10 tens for a hundred, etc.



**Pictorial/Abstract-** Draw representations using a place value grid, which will then lead to column method.

Solve:

Th	H	T	O
4	3	5	6
+ 3	2	4	3
7	5	9	9

**Add decimals with 2 decimal places, including money**

**Concrete-** Introduce decimal place value counters and model exchange for addition.



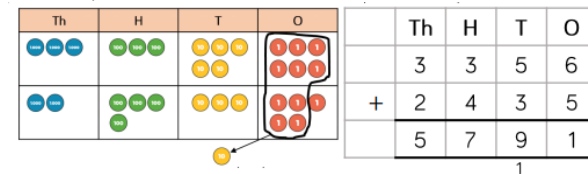
**Pictorial-**

## Year 6

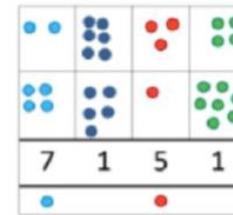
Column method-regrouping, abstract methods, place value counters to be used for adding decimal numbers.

**Column method- regrouping** As year 5, progressing to larger numbers, aiming for both conceptual understanding and procedural fluency with columnar method to be secured.

**Concrete-** Children continue to use base 10 or place value counters to add, exchanging 10 ones for a ten, 10 tens for a hundred, etc.



**Pictorial-** Draw representations using a place value grid.

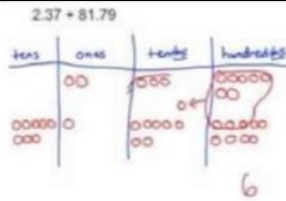


**Abstract-** Continue from previous work to carry hundreds as well as tens.

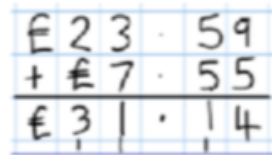
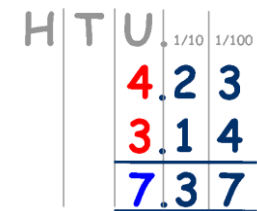
$$\begin{array}{r}
 3517 \\
 + 396 \\
 \hline
 3913
 \end{array}$$

**Add decimals with up to 3 decimal places**

**Concrete-** Continue to use decimal place value counters and model exchange for addition.



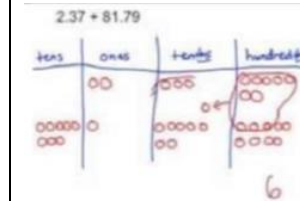
Abstract-



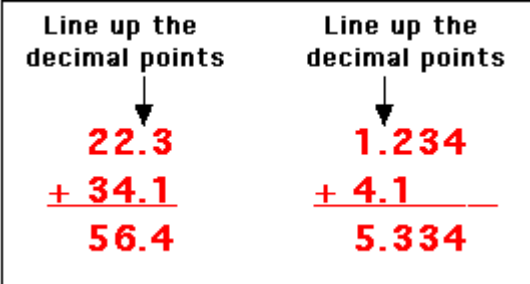
+



Pictorial-



Abstract-



Pupils will also learn to add three decimal numbers.

$$\begin{array}{r}
 3.452 \\
 9.74 \\
 \underline{29.338} +
 \end{array}$$

# Subtraction

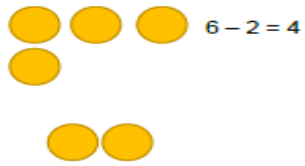
## Year 1

Taking away ones, counting back, finding the difference, use part-whole models and make 10 using the ten frame.

### Take away ones

**Concrete**-Use physical objects such as counters or cubes, to show how objects can be taken away.

Use physical objects, counters, cubes etc to show how objects can be taken away.



$$4 - 2 = 2$$

**Pictorial**- Cross out drawn objects to show what has been taken away.



**Abstract**-  
 $7 - 4 = 3$

$$16 - 9 = 7$$

### Counting back

**Concrete**- Move objects away from the group counting backwards.



Move the beads along the bead string as you count backwards.

## Year 2

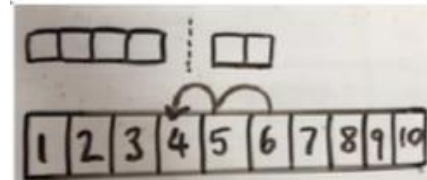
Counting back, finding the difference, part-whole model, make 10 and use of base 10.

### Counting back

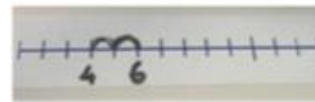
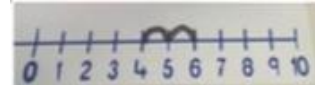
**Concrete**- Using number lines or number tracks, children start with the greatest number and count back.



**Pictorial**- Children to represent what they see pictorially:



**Abstract**- Represent the calculation on a number line and show their jumps. Encourage the children to use an empty number line.



### Find the difference

**Concrete**- Using cubes, Numicon or other objects to find the difference between two numbers.



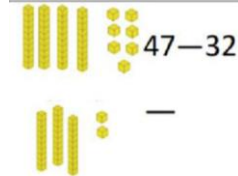
## Year 3

Column method with regrouping (up to 3 digits using place value counters)

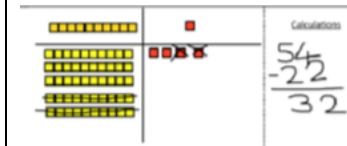
Pupil needing to use number lines from Year 2 into 3 should continue to do so depending on their ability.

### Column method without regrouping:

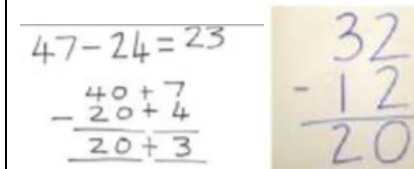
**Concrete**- Use base 10 or Numicon to model.



**Pictorial**- Draw representations to support understanding.



**Abstract**-

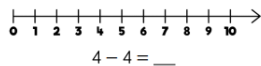
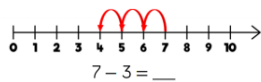


### Column method with regrouping

**Concrete**-Continue to introduce column subtraction modelled with place value counters or Dienes. e.g.  $255 - 28 =$



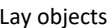
**Pictorial-**



**Abstract-** Put 13 in your head, count back 4. What number are you?

**Find the difference**

**Concrete-** 'Seven is 3 more than four'.



Lay objects to represent a bar model.



**Pictorial-**

How many more cakes does Whitney have than Teddy?

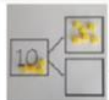


Whitney has \_\_\_ more cakes than Teddy.

**Abstract-** Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister?

**Represent and use number bonds and related subtraction facts within 20 (Part-whole model)**

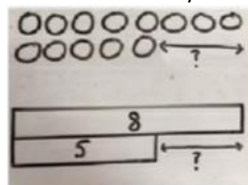
**Concrete-** Link to addition. Use PW model to model the inverse. If 10 is the whole and 6 is one of the parts, what is the other part?



the other part?

**Pictorial-** Use pictorial representations to show the part.

**Pictorial-** Children to draw the cubes or a bar model to illustrate what they need to calculate.

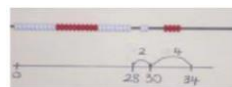


**Abstract-** Find the difference between 8 and 5.

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

**Make 10**

**Concrete-**



Use bead strings to model counting to the next ten and then the remaining part of the number.

**Pictorial-**

Can we use number bonds to subtract more efficiently?

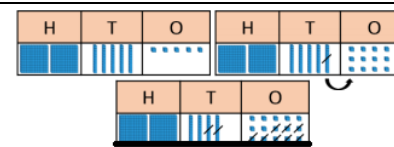
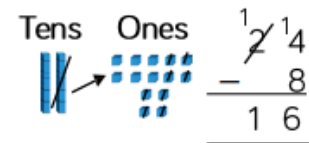


**Abstract-**

$20 - ? = 13$

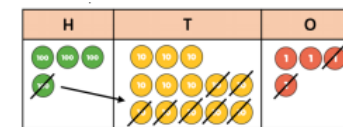
**Column method using base 10**

**Concrete-** Introduce column subtraction modelled with place value counters or Dienes.



	2	<del>4</del>	15
-		2	8
	2	2	7

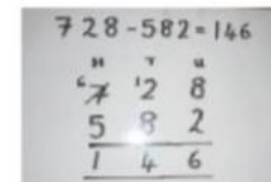
**Pictorial-** Children may draw base 10 or place value counters and cross off.

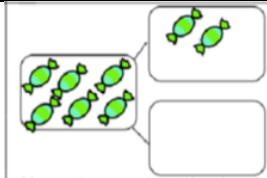


	<del>3</del>	1	3	4
-			7	2
	3	6	2	

e.g. 434-72=

**Abstract-** Move onto the formal method.





**Abstract-** Move to using numbers within the part-whole model.

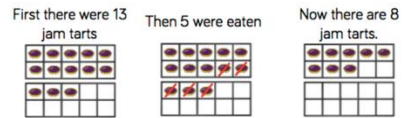
**Make 10**

**Concrete-** Make 14 on a ten frame. Take away 4 to make ten, then take one more away so that you have taken 5.



14-5=

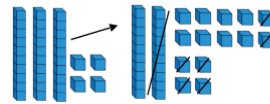
**Pictorial-**



Use ten as a stopping point on the number line.

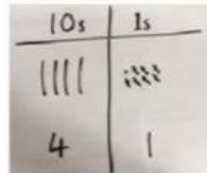
**Abstract-** 16-8. How many do we subtract first to get to 10? Then how many more do we need to subtract?

Take 16 away from 34

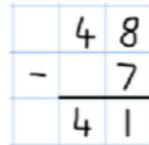


$$\begin{array}{r} 2 \cancel{3} 14 \\ - 16 \\ \hline 18 \end{array}$$

**Pictorial-** Children to represent the base 10 pictorially.



**Abstract-** Children to use the column method.



**Year 4**

Children will use the column method with regrouping (up to 4 digits).

**Column method with regrouping**

**Concrete-** Model process of exchange using Numicon, base 10 and then move to place value counters.

**Year 5**

Children will use the column method with regrouping. They will subtract decimals with the same amount of decimal places.

**Column method with regrouping**

**Concrete-** Model process of exchange using Numicon, base 10 and then move to place value counters.

**Year 6**

Column method with regrouping, abstract methods, place value counters for decimals- with different amounts of decimal places.

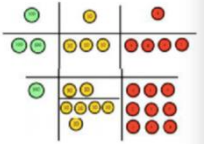
**Column method with regrouping**

As year 5, progressing to larger numbers, aiming for both conceptual understanding and procedural fluency with columnar method to be secured.

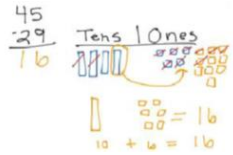
**Concrete-** Model process of exchange using Numicon, base 10 and then move to place value counters.



234 - 179



**Pictorial-** Children can draw base 10 or place value counters and cross off.



**Abstract-** Use the phrase 'exchange'.

Th	H	T	O
<del>2</del>	<del>3</del>	<del>4</del>	<del>4</del>
	<del>2</del>	<del>2</del>	<del>4</del>
	2	3	0

	Th	H	T	O
	3	4	5	4
-	1	2	2	4
	2	2	3	0

874 - 523 becomes

$$\begin{array}{r} 874 \\ - 523 \\ \hline 351 \end{array}$$

Answer: 351

932 - 457 becomes

$$\begin{array}{r} 932 \\ - 457 \\ \hline 475 \end{array}$$

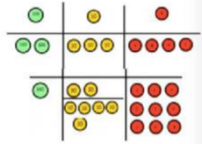
Answer: 475

932 - 457 becomes

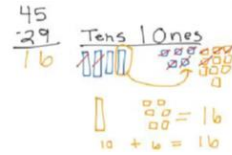
$$\begin{array}{r} 932 \\ - 457 \\ \hline 475 \end{array}$$

Answer: 475

234 - 179



**Pictorial-** Children can draw base 10 or place value counters and cross off.



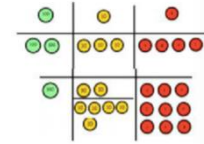
**Abstract-**

$$\begin{array}{r} 234 \\ - 179 \\ \hline 28928 \end{array}$$

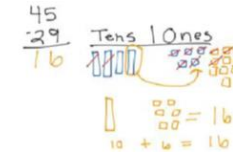
When subtracting decimals, use zeros for placeholders.

$$\begin{array}{r} 210.13 \\ - 27.59 \\ \hline 182.54 \end{array}$$

234 - 179



**Pictorial-** Children can draw base 10 or place value counters and cross off.



**Abstract-**

$$\begin{array}{r} 234.699 \\ - 179.949 \\ \hline 55.750 \end{array}$$

Continue calculating with decimals, including those with different numbers of decimal places

$$\begin{array}{r} 105.419 \\ - 36.080 \\ \hline 69.339 \end{array}$$

Find the missing numbers.  
What methods did you use?

3465	
2980	



## Multiplication

### Year 1

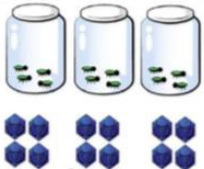
Recognise and make equal groups, doubling, counting in multiples, use cubes, Numicon and other objects in the classroom.

**Recognising and making equal groups, using repeated addition**

**Concrete-** There are 3 equal groups with 4 in each group:

$$3 \times 4$$

$$4 + 4 + 4$$



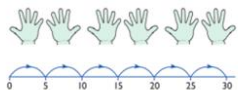
Washing line, and other practical resources for counting.  
Concrete objects. Numicon; bundles of straws, bead strings



$$2 + 2 + 2 + 2 + 2 = 10$$

$$2 \times 5 = 10$$

2 multiplied by 5  
5 pairs  
5 hops of 2



$$5 + 5 + 5 + 5 + 5 = 30$$

$$5 \times 6 = 30$$

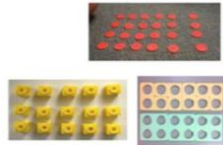
5 multiplied by 6  
6 groups of 5  
6 hops of 5

### Year 2

Multiply using arrays and repeated addition (using at least 2s, 5s and 10s.)

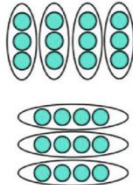
**Arrays showing commutative multiplication**

**Concrete-** Create arrays using counters, cubes and Numicon.



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

**Pictorial-** Use representations of arrays to show different calculations and explore commutativity.



### Year 3

$2d \times 1d$  using base 10

**Concrete/Pictorial-**

Use base ten and place value counters to represent multiplying  $2d \times 1d$ , before moving onto column method.

Tens	Ones

Tens	Ones

$$\square + \square + \square + \square = \square$$

$$\square \times \square = \square$$

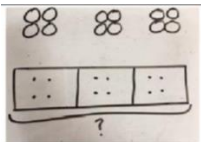
**Abstract-** Use base ten and place value counters to introduce the children to column method.

**Pictorial-** Children to represent the practical resources in a picture, use a bar model and arrays.

Josh is drawing equal groups of 3



Complete his drawing.



**Abstract-**

$$3 \times 4 = 12$$

$$4 + 4 + 4 = 12$$

**Doubling**

**Concrete-** Model doubling using base ten, Numico, place value counters, cubes etc.

Build	Represent



double 4 is 8  
 $4 \times 2 = 8$

**Pictorial-** Draw pictures and representations to show how to double numbers.

**Abstract-**

Add	Double
$1 + 1 = 2$	Double 1 is 2
$2 + 2 = \_$	Double 2 is $\_$
$3 + 3 = \_$	Double 3 is $\_$
$\_ + \_ = \_$	Double 4 is $\_$

**Counting in multiples of two, five and ten.**

**Abstract-** Use an array to write multiplication sentences and reinforce repeated addition.



$$5 + 5 + 5 = 15$$

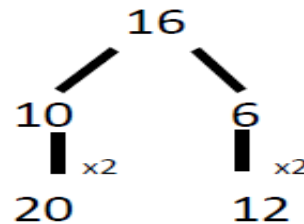
$$3 + 3 + 3 + 3 + 3 = 15$$

$$5 \times 3 = 15$$

$$3 \times 5 = 15$$

**Towards written methods**

Use jottings to develop an understanding of doubling two digit numbers.



Tens			Ones			

	T	O
	3	4
x		2
	6	8

**Concrete-**

Use a 0-100 bead string to count in tens.

Can we count forwards and backwards in tens?



**Pictorial-** Number lines, number squares, counting sticks and bar models should be used to show representations of counting in multiples.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

**Abstract-** Count in multiples of a number aloud.  
10, 20, 30, 40, 50, 60 etc.

$3 \times 10 =$

## Year 4

**Column multiplication-** introduced with place value counters (2 and 3 digit multiplied by 1 digit)

**Column method (2 and 3 digit multiplied by 1 digit)**

**Concrete-** Begin by using counting objects and resources.  
 $203 \times 3 =$

## Year 5

**Column multiplication.**

Abstract only but might need a repeat of year 4 first (up to 4 digit numbers multiplied by 1 or 2 digits).

**Column method (3 and 4 digits x 1 or 2 digits)**

**Concrete-** Manipulatives may still be used with the corresponding long multiplication modelled alongside.

**Pictorial-** Introduce long multiplication alongside the grid method to show the relationship between the answers in each row.

## Year 6

**Column multiplication.**

Abstract methods (multi-digit up to 4 digits by a 2 digit number).

**Column method**

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the efficient written method of long multiplication.

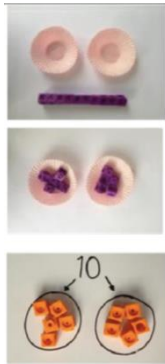
Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

**Compact Vertical Method**



**Division as sharing**

**Concrete-** I have 10 cubes. Can you share them equally in two groups?



**Pictorial-** Children use pictures or shapes to share quantities.

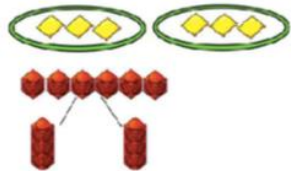


8 shared between 2 is 4

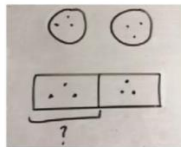
**Abstract-** 12 shared between 3 is 4.

**Division as grouping**

**Concrete-** Children to group using a range of objects.

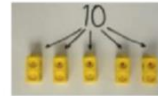


**Pictorial-** Represent the grouping pictorially.



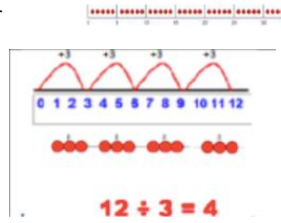
**Division as grouping**

**Concrete-** Divide the quantities into equal groups. Use objects to aid understanding.

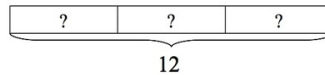


**Pictorial-** Use number lines for grouping.

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 in each group.



12 ÷ 3 = ?



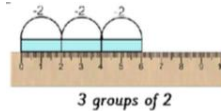
**Abstract-**

28 ÷ 7 = 4

Divide 28 into 7 groups. How many are in each group?

**Repeated subtraction**

**Concrete-** Use rods or multilink above a ruler.

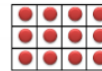


**Abstract-** Children to represent repeated subtraction pictorially.

**Arrays**

Continue work on arrays.

Support children to understand how multiplication and division are inverse. Look



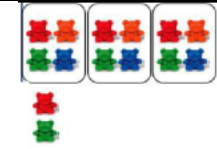
3 x 4 = 12

12 ÷ 4 = 3

a

**Division with a remainder**

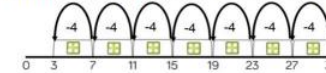
**Concrete-** Divide objects between groups and see how much is left over.



14 ÷ 3 =

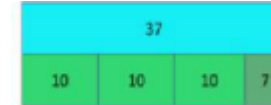
**Pictorial-** Becoming more efficient using a number line when solving division problems with a remainder

Tommy uses repeated subtraction to solve 31 ÷ 4

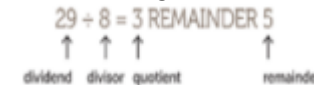


31 ÷ 4 = 7 r 3

Use bar models to show division with a remainder



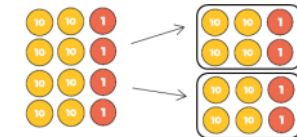
**Abstract-** Complete written divisions and show the remainder using r.



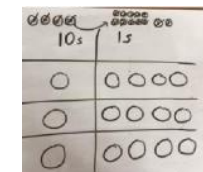
**Dividing a 2-digit number by a 1-digit number**

**Concrete-** Divide 2-digit numbers by a 1-digit

number by partitioning into tens and ones and sharing into equal groups. Use place value counters to do this.



**Pictorial-** Children to represent the place value counters pictorially.



**Abstract-**

42 ÷ 3  
42 = 30 + 12  
30 ÷ 3 = 10  
12 ÷ 3 = 4  
10 + 4 = 14

## Year 4

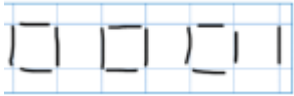
Divide up to 3 digit numbers by a 1 digit number (initially without remainders, then with).

### Division with a remainder

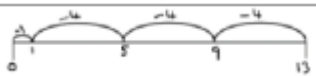
**Concrete-** Use of lollipop sticks to form whole-squares are made because we are dividing by 4. There are 3 whole squares with one left over.



**Pictorial-** Children to represent the lollipop sticks pictorially.

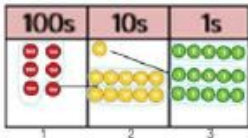


**Abstract-** Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line.

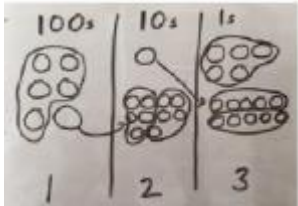


### Division with up to 3 digits by 1 digit-concrete and pictorial

**Concrete-** Use place value counters to group e.g. 615 divided by 5.



**Pictorial-** Represent the place value counter pictorially.



## Year 5

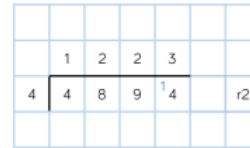
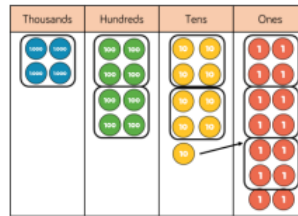
Divide up to a 4 digit number by a 1 digit number, including those with remainders.

### Short division (up to 4 digits by a 1 digit number including remainders)

**Concrete-** As year 4 using remainders.

### Pictorial/Abstract-

Show the method of short division using place value counters for before introducing short division with and without remainders:



## Year 6

Divide at least 4 digits by both 1 digit and 2 digit numbers (including decimals).

### Short division

As year 5, ensuring that children also exchange into tenths and hundredths column.

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{44} \phantom{0} \\ 59 \phantom{0} \\ \underline{55} \phantom{0} \\ 46 \\ \underline{44} \\ 2 \end{array}$$

Answer:  $45 \frac{1}{11}$

### Long Division

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r}12 \\ 15 \overline{) 432} \\ \underline{30} \phantom{0} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432.0} \\ \underline{30} \phantom{0} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

$$\frac{12}{15} = \frac{4}{5}$$

Answer:  $28 \frac{4}{5}$

432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \phantom{0} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

### Dividing decimals

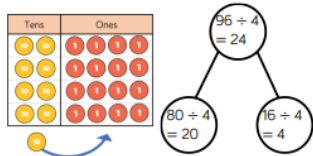
**Concrete-** Use place value counters and group e.g. 3.69 divided by 3



**Pictorial-** Use part-whole and bar models

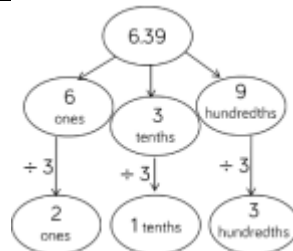
**Abstract-**

Rosie is calculating 96 divided by 4 using place value counters. First, she divides the tens. She has one ten remaining so she exchanges one ten for ten ones. Then, she divides the ones.

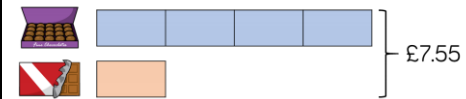


Use Rosie's method to solve  
 $65 \div 5$   
 $75 \div 5$   
 $84 \div 6$

Use the above methods to write answers.



A box of chocolates costs 4 times as much as a chocolate bar. Together they cost £7.55



**Abstract-**Short division to divide decimals by an integer.