Foulsham and Corpusty Primary School

Calculation Policy

At Foulsham and Corpusty Primary School's we encourage children to have a love for numbers.

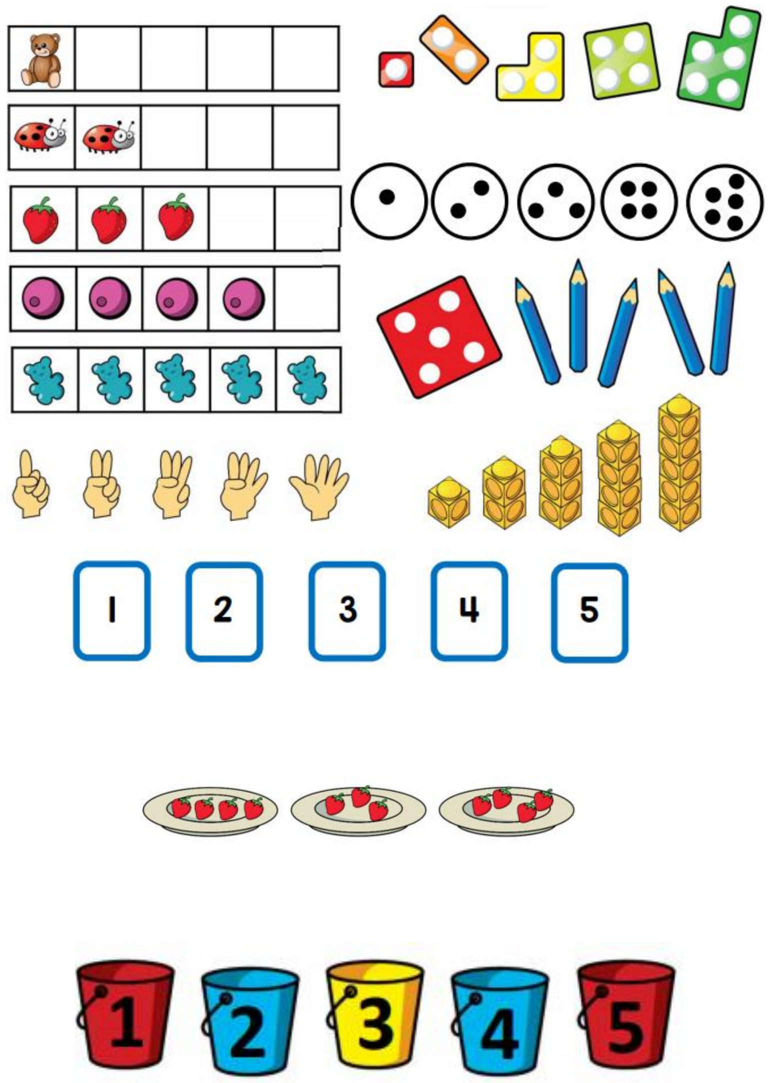
This calculation policy has been devised to ensure a consistent and smooth progression of learning in calculations across Foulsham Primary School and Corpusty Primary School. The policy will show examples of CPA (Concrete, Pictorial and Abstract) methods to support children's learning.

Aims:

- To support consistency of teaching mathematical calculations across the school.
- Pupils will develop a love and enthusiasm for mathematics that will promote confidence and carry them throughout their lives.
- Pupils have a greater understanding of mathematical methods rather than a set of memorised procedures.
- Each pupil will have and understanding of mathematical vocabulary and use this to communicate ideas.
- Pupils will make mathematical connections using CPA approach.
- Pupils will demonstrate fluency in mental and written calculations.
- Pupils will be given opportunities to use and apply calculations in cross curricular mathematics.
- Pupils are confident in choosing and using a strategy that they know will get them to the correct answer as efficiently as possible; pupils are free to choose their preferred method to solve calculations.
- To provide reference and guidance on teaching calculation skills for teaching staff, teaching assistants, parents and family members.

At Foulsham and Corpusty we use White Rose Hub to support the teaching of Mathematics from EYFS – Year 6. You can find more information here: www.whiterosemaths.com

Mathematics in the Early Years:



Mathematics: Children in reception will be learning to:

- **Count objects, actions and sounds.**

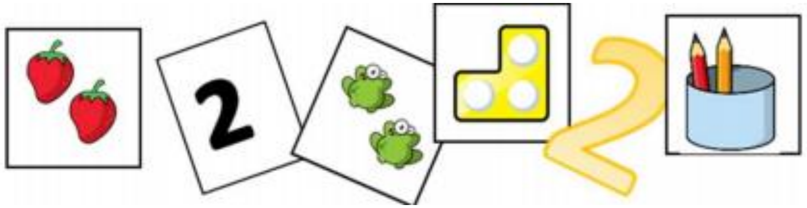
  Examples of how to support this: -

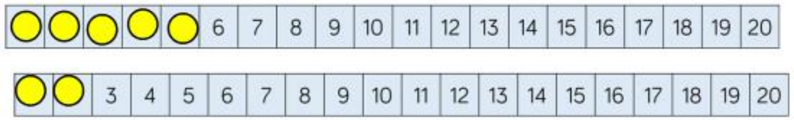
  - Develop the key skills of counting objects including saying the numbers in order and matching one number name to each item.
  - Say how many there are after counting – for example, "…6, 7, 8. There are 8 balls" – to help children appreciate that the last number of the count indicates the total number of the group. This is the cardinal counting principle.
  - Say how many there might be before you count to give a purpose to counting: "I think there are about 8. Shall we count to see?"
  - Count out a smaller number from a larger group: "Give me seven…" Knowing when to stop shows that children understand the cardinal principle.
  - Build counting into everyday routines such as register time, tidying up, lining up or counting out pieces of fruit at snack time.
  - Sing counting songs and number rhymes and read stories that involve counting. Play games which involve counting. Identify children who have had less prior experience of counting and provide additional opportunities for counting practice.

- **Subitise**

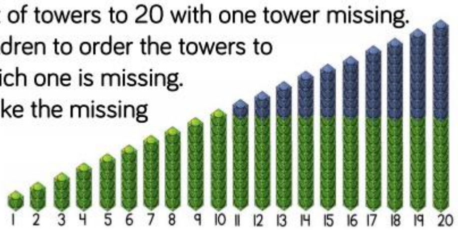
  Examples of how to support this: -

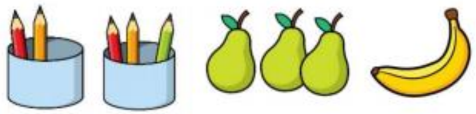
  - Show small quantities in familiar patterns (for example, dice) and random arrangements.
  - Play games which involve quickly revealing and hiding numbers of objects.
  - Put objects into five frames and then ten frames to begin to familiarise children with the tens structure of the number system. Prompt children to subitise first when enumerating groups of up to 4 or 5 objects: "I don't think we need to count those. They are in a square shape so there must be 4." Count to check.
  - Encourage children to show a number of fingers 'all at once', without counting.





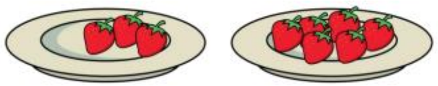
Provide a set of towers to 20 with one tower missing. Ask the children to order the towers to identify which one is missing. Can they make the missing tower?





Which set has more? Fewer?

Can you find 2 sets with the same amount?



Mathematics: Children in reception will be learning to:

- **Link the number symbol (numeral) with its cardinal number value.**

  Examples of how to support this: -

  - Display numerals in order alongside dot quantities or tens frame arrangements.
  - Play card games such as snap or matching pairs with cards where some have numerals, and some have dot arrangements.
  - Discuss the different ways children might record quantities (for example, scores in games), such as tallies, dots and using numeral cards.

- **Count beyond ten.**

  Examples of how to support this: -

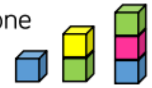
  - Count verbally beyond 20, pausing at each multiple of 10 to draw out the structure, for instance when playing hide and seek, or to time children getting ready.
  - Provide images such as number tracks, calendars and hundred squares indoors and out, including painted on the ground, so children become familiar with two-digit numbers and can start to spot patterns within them.

- **Compare numbers.**

  Examples of how to support this: -

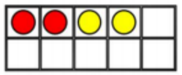
  - Provide collections to compare, starting with a very different number of things.
  - Include more small things and fewer large things, spread them out and bunch them up, to draw attention to the number not the size of things or the space they take up. Include groups where the number of items is the same.
  - Use vocabulary: 'more than', 'less than', 'fewer', 'the same as', 'equal to'. Encourage children to use these words as well.
  - Distribute items evenly, for example: "Put 3 in each bag," or give the same number of pieces of fruit to each child. Make deliberate mistakes to provoke discussion.
  - Tell a story about a character distributing snacks unfairly and invite children to make sure everyone has the same.

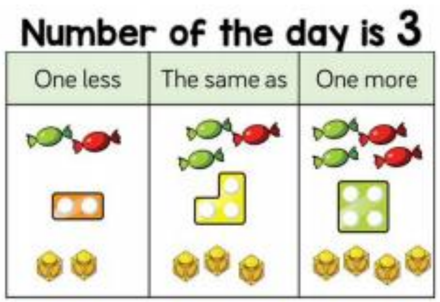
Use stories and number songs which count on and back to introduce the one more and one less patterns. Represent the patterns using bricks or cubes to support the understanding that each number is one more/less than the number before.

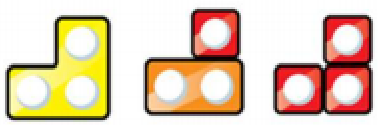


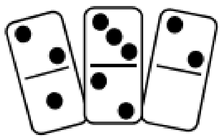
Use first, then, now to tell simple maths stories to practise adding more in real life contexts.

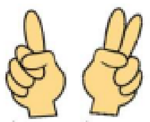
First there were 2 people on the bus.
Then 2 more people got on the bus.
Now there are 4 people on the bus.







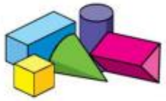


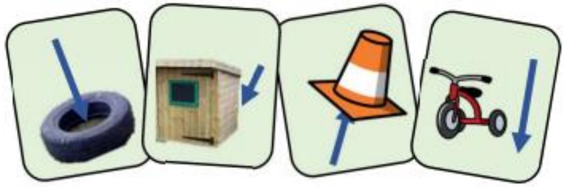
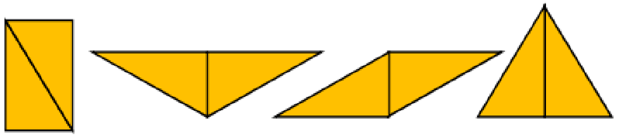


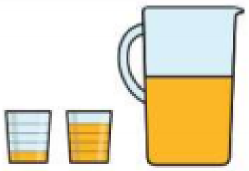
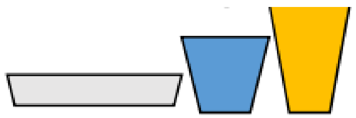
Play Bunny Ears

Mathematics: Children in reception will be learning to:

- **Understand the 'one more than/one less than' relationship between consecutive numbers.**
  Examples of how to support this: -
  - Make predictions about what the outcome will be in stories, rhymes and songs if one is added, or if one is taken away.
  - Provide 'staircase' patterns which show that the next counting number includes the previous number plus one.
- **Explore the composition of number to 10.**
  Examples of how to support this: -
  - Focus on composition of 2, 3, 4 and 5 before moving onto larger numbers.
  - Provide a range of visual models of numbers: for example, six as double three on dice, or the fingers on one hand and one more, or as four and two with ten frame images.
  - Model conceptual subitising: "Well, there are three here and three here, so there must be six."
  - Emphasise the parts within the whole: "There were 8 eggs in the incubator. Two have hatched and 6 have not yet hatched."
  - Plan games which involve partitioning and recombining sets. For example, throw 5 beanbags, aiming for a hoop. How many go in and how many don't?
- **Automatically recall number bonds for numbers 0 – 5 and some to 10.**
  Examples of how to support this: -
  - Have a sustained focus on each number to and within 5. Make visual and practical displays in the classroom showing the different ways of making numbers to 5 so that children can refer to these.
  - Help children to learn number bonds through lots of hands-on experiences of partitioning and combining numbers in different contexts, and seeing subitising patterns.
  - Play hiding games with a number of objects in a box, under a cloth, in a tent, in a cave, etc.: "6 went in the tent and 3 came out. I wonder how many are still in there?"
  - Intentionally give children the wrong number of things. For example: ask each child to plant 4 seeds then give them 1, 2 or 3. "I've only got 1 seed, I need 3 more."
  - Spot and use opportunities for children to apply number bonds: "There are 5 of us but only 2 clipboards. How many more do we need?"
  - Place objects into a five frame and talk about how many spaces are filled and unfilled.

Mud Kitchen


Mathematics: Children in reception will be learning to:

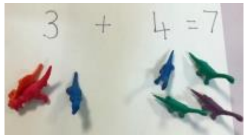
- **Select, rotate and manipulate shapes to develop spatial reasoning skills.**
  Examples of how to support this: -
  - Provide high-quality pattern and building sets, including pattern blocks, tangrams, building blocks and magnetic construction tiles, as well as found materials.
  - Challenge children to copy increasingly complex 2D pictures and patterns with these 3D resources, guided by knowledge of learning trajectories: "I bet you can't add an arch to that," or "Maybe tomorrow someone will build a staircase."
  - Teach children to solve a range of jigsaws of increasing challenge.
- **Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.**
  Examples of how to support this: -
  - Investigate how shapes can be combined to make new shapes: for example, two triangles can be put together to make a square. Encourage children to predict what shapes they will make when paper is folded. Wonder aloud how many ways there are to make a hexagon with pattern blocks.
  - Find 2D shapes within 3D shapes, including through printing or shadow play.
- **Continue, copy and create repeating patterns.**
  Examples of how to support this: -
  - Make patterns with varying rules (including AB, ABB and ABBC) and objects and invite children to continue the pattern.
  - Make a deliberate mistake and discuss how to fix it
- **Compare length, weight and capacity.**
  Examples of how to support this: -
  - Model comparative language using 'than' and encourage children to use this vocabulary. For example: "This is heavier than that."
  - Ask children to make and test predictions. "What if we pour the jugful into the teapot? Which holds more?"

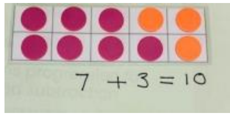
Addition:

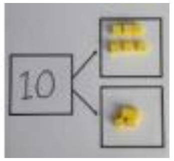
Step one

Children will be able to:
Add by combing two parts to make a whole.

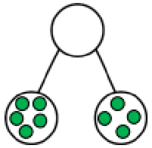
Concrete:

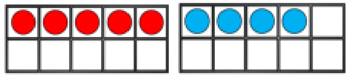






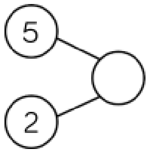
Pictorial:





Use the pictures to add two numbers together to make a whole.

Abstract:



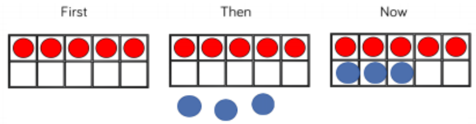
4 + 3 = 7

Step two

Children will be able to:
Add by counting on from the biggest number.

Concrete:

Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.



Pictorial:

12 + 5 = 17

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

Abstract:

5 + 12 = 17

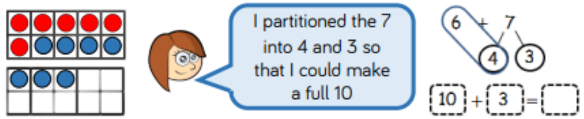
Place the larger number in your head and count on the smaller number to find your answer.

Step three

Children will be able to:
Add by regrouping to make 10 (an essential skill for column addition later.)

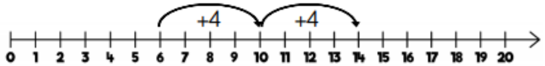
Concrete:

Rosie has used the 10 frames to calculate 6 + 7



Pictorial:

Mo has used a number line to calculate 6 + 8



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

Abstract:

7 + 4= 11

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

Addition:

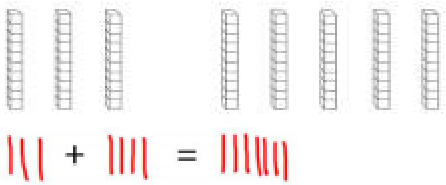
Step four

Children will be able to:
Add multiples of ten

Concrete:
30 + 20 = 50

Model using base ten or a bead string.

Pictorial:



Use representations for base ten or children draw representations of base ten.

Abstract:

20 + 30 = 50

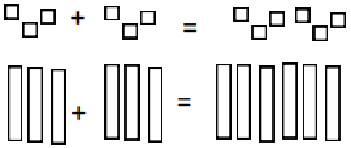
70 = 50 + 20

40 + □ = 60

Step five

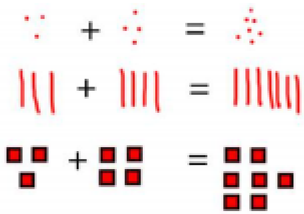
Children will be able to:
Use known number facts

Concrete:



Using base ten, children recognise that they can use their knowledge of 3 ones + 3 ones = 6 ones so 3 tens + 3 tens = 6 tens.

Pictorial:



Children draw representations of tens and ones.

Abstract:

3 + 4 = 7

leads to

30 + 40 = 70

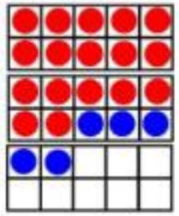
leads to

300 + 400 = 700

Step six

Children will be able to:
Add a two-digit number and ones

Concrete:



17 + 5 = 22

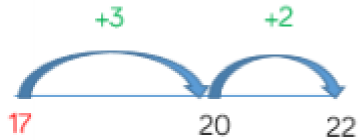
Use ten frame to make 'magic ten

Children explore the pattern.

17 + 5 = 22

27 + 5 = 32

Pictorial:
17 + 5 =



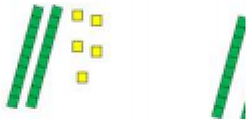
Abstract:
24 + 5 =
Place the larger number in your head and count on the smaller number to find your answer.

Addition:

Step seven

Children will be able to:
Add a 2 digit number and tens

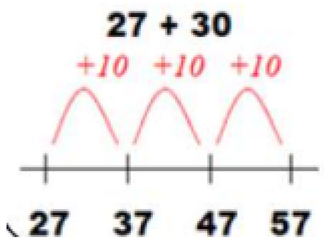
Concrete:



25 + 10 = 35

Explore that the ones digit does not change

Pictorial:



Abstract:

27 + 10 = 37

27 + 20 = 47

27 + □ = 57

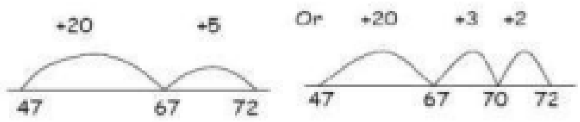
Step eight

Children will be able to:
Add two 2-digit numbers

Concrete:

Model using dienes , place value counters and numicon

Pictorial:



Use number line and bridge ten using part whole if necessary.

Abstract:

25 + 47

20 + 5   40 + 7

20 + 40 = 60

5+ 7 =12

60 + 12 = 72

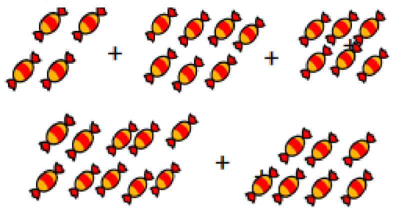
Step nine

Children will be able to:
Add three 1-digit numbers

Concrete:
4 + 7 + 6= 17
Put 4 and 6 together to make 10. Add on 7.

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

Pictorial:



Add together three groups of objects. Draw a picture to recombine the groups to make 10.

Abstract:

4 + 7 + 6 = $\boxed{10}$ + $\boxed{7}$

10

= $\boxed{17}$

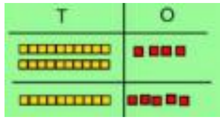
Combine the two numbers that make 10 and then add on the remainder.

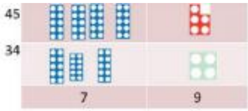
Addition:

Step ten

Children will be able to:
Column addition – no regrouping (friendly numbers).

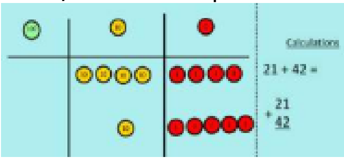
Concrete:





Model using base ten or numicon. Add together the ones first, then the tens.

Then, move onto place value counters.



Pictorial:

Children move to drawing counters or base ten using a tens and ones frame.

Abstract:

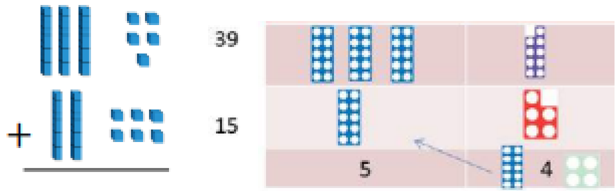
$$\begin{array}{r} 2\ 2\ 3 \\ +\ 1\ 1\ 4 \\ \hline 3\ 3\ 7 \end{array}$$

Add the ones first, then the tens, then the hundreds.

Step eleven

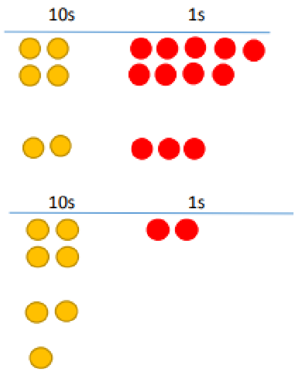
Children will be able to:
Column addition with regrouping

Concrete:



Exchange ten ones for a ten. Model using base ten, numicon for place value counters.

Pictorial:



Children can draw the counters to help them to solve additions.

Abstract:

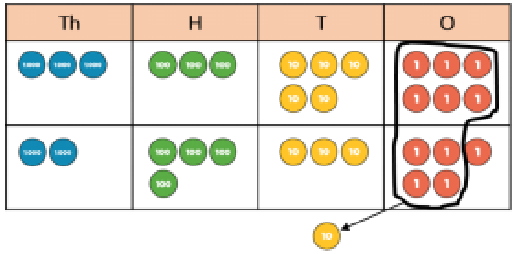
40 + 9
<u>20 + 3</u>
60 + 12 = 72

Start by partitioning the numbers before formal column to show the exchange.

Step twelve

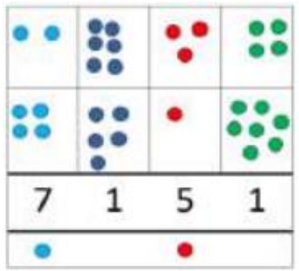
Children will be able to:
Add numbers with up to 4 digits

Concrete:



Children continue to use place value counters and base ten to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.

Pictorial:



Children to draw representations using place value grid.

Abstract:

$$\begin{array}{r} 3\ 5\ 1\ 7 \\ +\ \ \ 3\ 9\ 6 \\ \hline 3\ 9\ 1\ 3 \end{array}$$

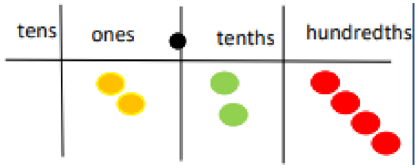
Addition:

Step thirteen

Children will be able to:

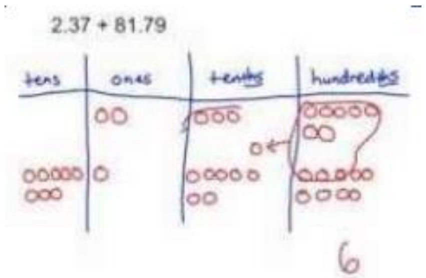
- Add numbers with more than 4 digits – (*Children should continue with step ten, eleven and twelve.)*
- Add decimals with 2 decimal places, including money.

Concrete:

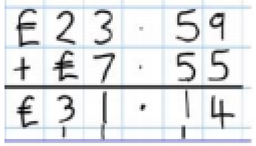


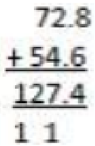
Introduce decimal place value counters and model exchange for addition.

Pictorial:



Abstract:





Step fourteen

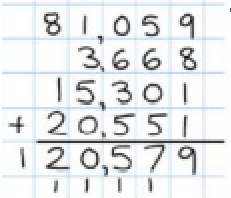
Children will be able to:

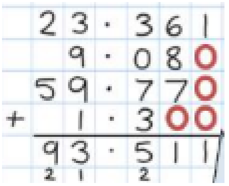
Add several numbers of increasing complexity, including adding money, measure and decimals with different numbers of decimal points.

Concrete: As step thirteen

Pictorial: As step thirteen

Abstract:





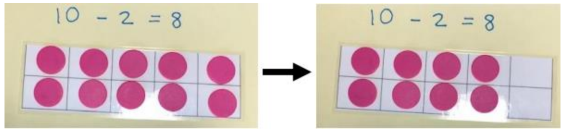
Insert zeros for place holders

Subtraction:

<table>
<tr><th>Step one</th><th>Step two</th><th>Step three</th></tr>
<tr>
<td>

Children will be able to:
Take away ones

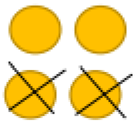
Concrete:



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

Pictorial:

4 – 2 = 2



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

Abstract:

7—4 = 3

16—9 = 7

</td>
<td>

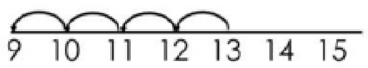
Children will be able to:
Count back

Concrete:

Make the largest number in your subtraction. Move objects away from the group, counting backwards.

Make the largest number in your subtraction. Move the beads along your bead string as you count backwards in ones.

Pictorial:
Count back on a number line or number track



Start at the bigger number and count back the smaller number, showing the jumps on the number line.

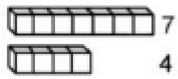
Abstract:

Put 13 in your head, count back 4. What number are you at?
Use your fingers to help.

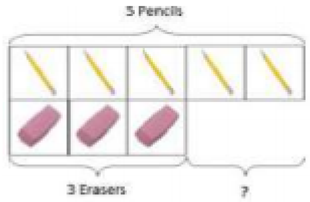
</td>
<td>

Children will be able to:
Find the difference

Concrete:

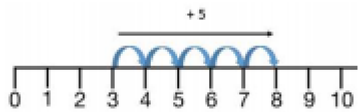


Use cubes to build towers to find the difference.



Lay out objects to represent bar models to find the difference.

Pictorial:



Count on to find the difference.

Abstract:

Hannah has 8 goldfish.
Helen has 3 goldfish.
Find the difference between the number of goldfish the girls have.

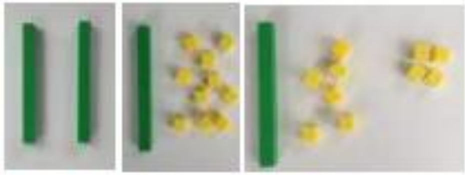
</td>
</tr>
</table>

Subtraction:

Step four

Children will be able to:
Regroup a ten into ten ones

Concrete:



Use a place value chart to show how to change a ten into ten ones, to enable you to take them away. Use the term 'exchange'.

Pictorial:
13 – 5 =

Children to use crossing out of pictures or of their own drawings.

Abstract:

20—4 = 16

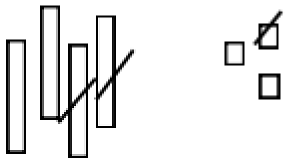
Step five

Children will be able to:
Partitioning to subtract without regrouping 'friendly numbers'

Concrete:
34 – 13 =

Use base ten to show children how to partition the number when subtracting without regrouping. E.g. 4 – 3 and 30 – 10.

Pictorial:



43—21 = 22

Children draw representations of base ten and cross off.

Abstract:

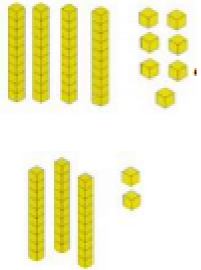
43—21 = 22

Step six

Children will be able to:
Column subtraction without regrouping (friendly numbers).

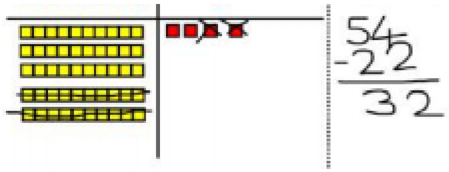
Concrete:

47 – 32 =



Use base ten, numicon or place value counters to model this.

Pictorial:



Draw the base ten or place value counters alongside the written calculation to help to show working.

Abstract:
47 – 24 = 23

40 – 20 = 20
7 – 4 = 3
20 + 3 = 23

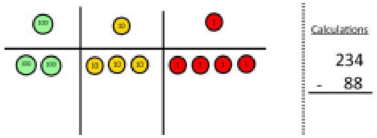
This will lead to a clear written column subtraction.

Subtraction:

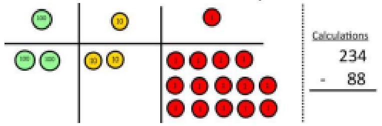
Step seven

Children will be able to:
Column subtraction with regrouping

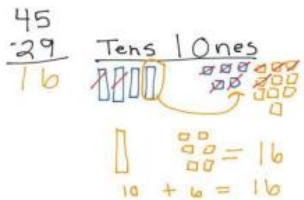
Concrete:
Begin with base ten before moving on to place value counters. Model the exchange of a ten into ten ones. Start with once exchange before moving onto subtractions with two exchanges.



Start with the ones, can I take away 8 from 4 easily? I need to exchange 1 of my tens for 10 ones. Now I can subtract my ones.



Pictorial:



Children may draw base ten or place value counters and cross off and show the exchange.

Abstract:

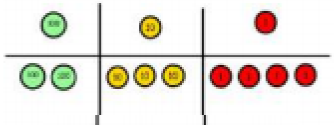
Begin by partitioning into place value columns. Then move to formal method.

Step eight

Children will be able to:
subtracting tens and ones
Subtract with up to 4 digits

Concrete:

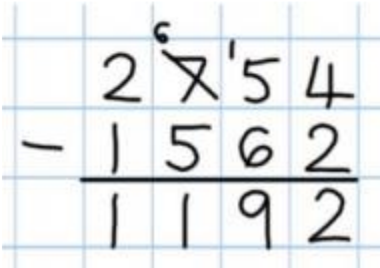
234 - 179



Model the process of exchange using base ten or numicon and then move to place value counters.

Pictorial:
See step seven – children to draw place value counters or base ten and show their exchange.

Abstract:



Step nine

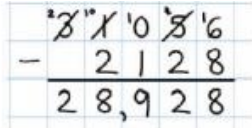
Children will be able to:
Subtract with at least 4 digits, including money and measures.

Subtract with increasingly large and more complex numbers and decimal values.

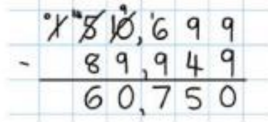
Concrete:
See step eight

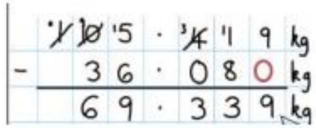
Pictorial:
See step seven - children to draw place value counters or base ten and show their exchange.

Abstract:



Use zeros for place-holders.





Multiplication:

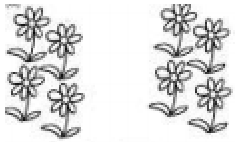
<table>
<tr><th>Step one</th><th>Step two</th><th>Step three</th></tr>
<tr>
<td>

Children will be able to:
Making equal groups and counting the total

Concrete:

Use manipulatives to make equal groups. Ensure that children can identify when groups are equal or unequal.

Pictorial:



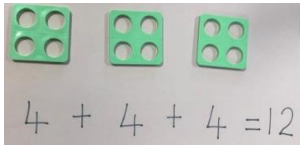
Draw representation to show equal groups.

Abstract:
If I have 2 equal groups and I have 5 in one group, how many are in the other group?

</td>
<td>

Children will be able to:
Repeated addition

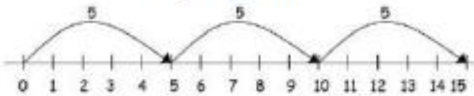
Concrete:



Use different objects to add equal groups.

Pictorial:
There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?

2 + 2 + 2 = 6



5 + 5 + 5 = 15

Use pictures and number lines to solve problems.

Abstract:
Write addition sentences to describe objects and pictures.

2 + 2 + 2 = 6

</td>
<td>

Children will be able to:
Understanding arrays

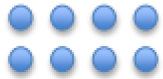
Concrete:

"Build an array with counters to represent the apples."

There are _____ apples in each row.
There are _____ rows.
_____ + _____ + _____ = _______
There are ______ apples altogether.

Pictorial:
Draw an array to show 4 columns with 2 cookies in each column.



Abstract:
Write an addition number sentence to describe the array.

</td>
</tr>
</table>

Multiplication:

Step four

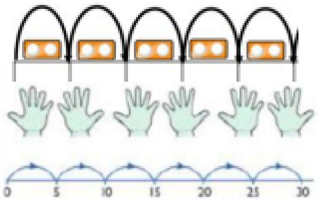
Children will be able to:
Count in multiples of 2, 3, 5 and 10 from 0. (Repeated addition.)

Concrete:

5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40

Count the groups as children are skip counting, children may use their fingers, bead strings, numicon or bar models.

Pictorial:



Number lines, counting sticks and bar models should be used to show representation of counting in multiples.

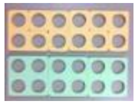
Abstract:
Count in multiples aloud

Write sequences with multiples of numbers.

Step five

Children will be able to:
Multiplication is commutative

Concrete:

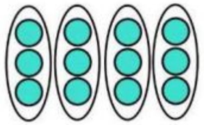
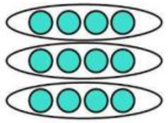
  

Create arrays using counters, cubes or numicon.

Children 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.

Abstract:

5 + 5 + 5 = 15

3 + 3 + 3 + 3 + 3 = 15

5 x 3 = 15

3 x 5 = 15

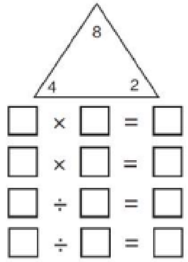
Use an array to write multiplication sentences and reinforce repeated addition.

Step six

Children will be able to:
Use the inverse – this should be taught alongside division, so children learn how they work alongside each other.

Concrete:

Pictorial:



Abstract:

2 x 4 = 8

4 x 2 = 8

8 ÷ 2 = 4

8 ÷ 4 = 2

8 = 2 x 4

8 = 4 x 2

2 = 8 ÷ 4

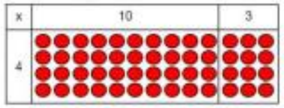
4 = 8÷ 2

Multiplication:

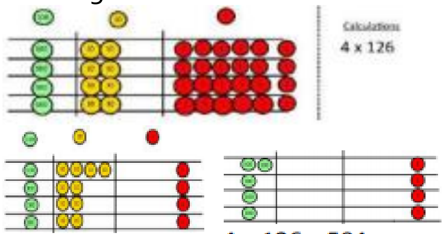
Step seven

Children will be able to:
Grid method

Concrete:
Show the link with arrays to first introduce the grid method. 4 rows of 10. 4 rows of 3.

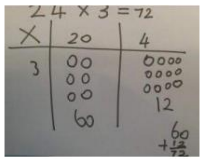


Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows. Fill each row with 126. Add up each column, starting with the ones making any exchanges needed.



4 × 126 = 504

Pictorial:



Children to draw counters, using colours to show different amounts or circles in different columns to show their thinking.

Abstract:

×	30	5
7	210	35

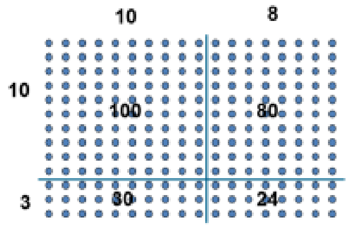
210 + 35 = 245

Start with multiplying by one-digit numbers and then move to a 2-digit number.

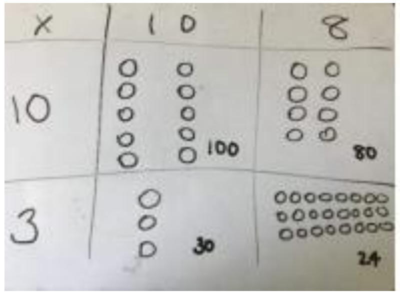
Step eight

Children will be able to:
Expanded method

Concrete:
Show the link with arrays to first introduce the expanded method.



Pictorial:



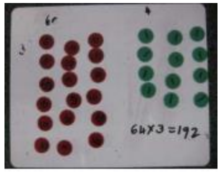
Abstract:
Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

```
   18
x  13
   24  (3 x 8)
   30  (3 x 10))
   80  (10 x 8)
  100  (10 x 10)
  234
```

Step nine

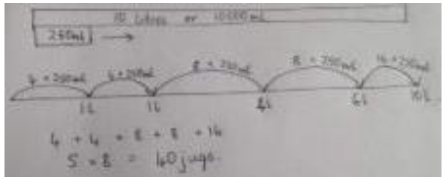
Children will be able to:
Compact method

Concrete:
Children can continue to be supported by place value counters at this stage of multiplication.



It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Pictorial:



Bar modelling and number lines can support learners when solving problems.

Abstract:
Start with long multiplication before moving to the more compact method.

```
   1342
x    18
  13420
  10736
  24156
```

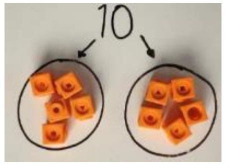
Division:

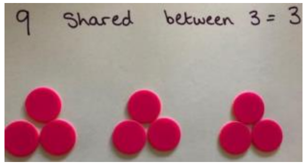
Step one

Children will be able to:
Division as sharing (not using the division symbol.)

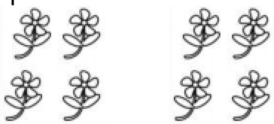
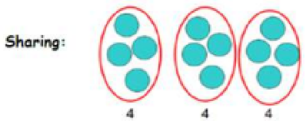
Concrete:
I have 10 cubes; can you share them equally between two people?







Pictorial:
Children use pictures, shapes or drawings to share quantities. 8 shared between 2 is 4.

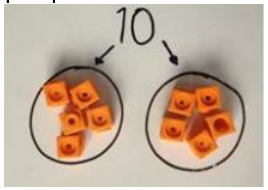



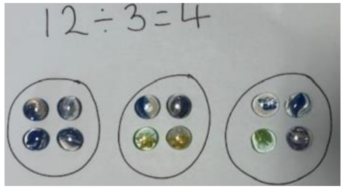
Abstract:
12 shared between 3 is 4.

Step two

Children will be able to:
Division as sharing (introducing the division symbol.)

Concrete:
I have 10 cubes; can you share them equally between two people?

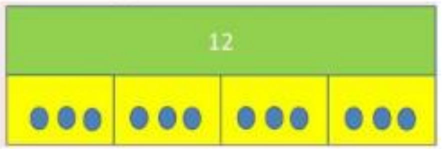




Pictorial:

$8 \div 2 = 4$

Children use bar modelling to show and support understanding.



$12 \div 4 = 3$

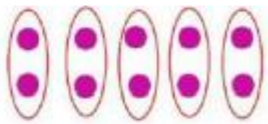
Abstract:
Share 12 buns between 3 people.

$$12 \div 3 = 4$$

Step three

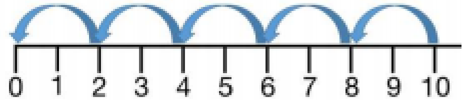
Children will be able to:
Division as grouping

Concrete:
Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.

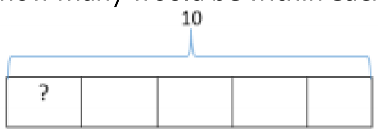


"I have 10. Make equal groups of 2. How many groups do you have? This shows 10 divided by 2 = 5."

Pictorial:
Use a number line to show jumps in groups. The number of jumps equals the number of groups.



Think of a bar model as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.



10 divided by 5 =
5 x? = 10

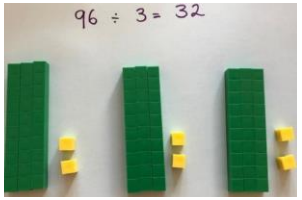
Abstract:
10 divided by 5 = 2
Divide 10 into 5 groups. How many are in each group?

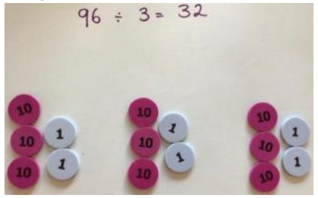
Division:

Step four

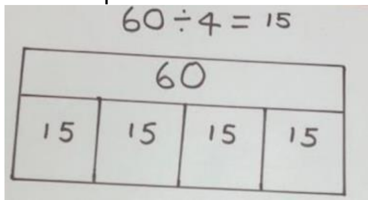
Children will be able to:
Division as grouping

Concrete:
Use cubes, counters, objects or place value counter to aid understanding.





Pictorial:
Continue to use bar modelling to aid solving division problems.



Abstract:

How many groups of 6 in 24?

$24 \div 6 = 4$

Step five

Children will be able to:
Division with arrays

Concrete:

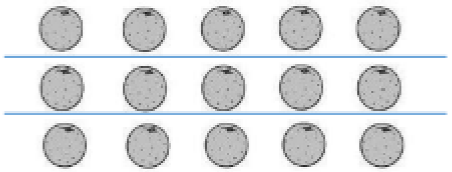
Link division to multiplication by creating an array and thinking about the number sentences that can be created.

E.g.

$3 \times 5 = 15$ $5 \times 3 = 15$

15 divided by 3 = 5 15 divided by 5 = 3

Pictorial:



Draw an array and use lines to split the array into groups to make multiplication and division sentences.

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

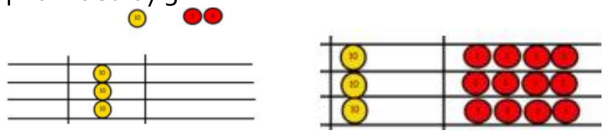
$5 \times 3 = 15$
$3 \times 5 = 15$
$15 \div 5 = 3$
$15 \div 3 = 5$

Step six

Children will be able to:
Short division

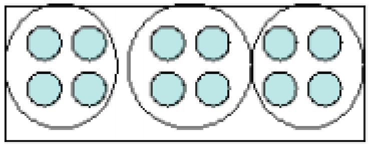
Concrete:
Use place value counters to divide using the bus stop method alongside.

42 divided by 3 =



Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over. We exchange this ten for ten one and then we share the ones equally among the groups. We look how much we have in one group so the answer is 14.

Pictorial:



Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups. Encourage them to move towards counting in multiples to divide more efficiently.

Abstract:

```
    2  1  8
         3
4 | 8  7  2
```

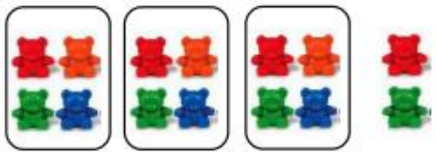
Begin with divisions that divide equally with no remainder.

Division:

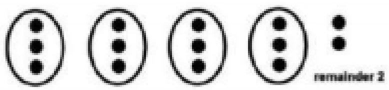
Step seven

Children will be able to:
Division with remainders

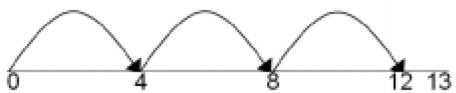
Concrete:
14 ÷ 3 =
Divide objects between groups and see how much is left over



Pictorial:
Draw dots and group them to divide an amount and clearly show a remainder.



Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.



Abstract:

29 ÷ 8 = 3 REMAINDER 5
dividend divisor quotient remainder

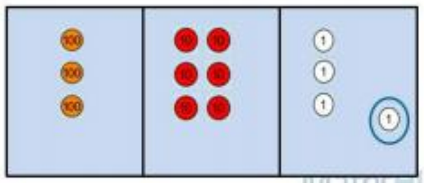
Complete written divisions and show the remainder using r.

Step eight

Children will be able to:
Short division with reaminders

Concrete:
364 ÷ 3 =

121 rem 1
3 | 364



Pictorial:
See step seven.

Abstract:
Move onto divisions with a remainder.
Once children understand remainders, begin to express as a fraction or decimal according to the context.

86 r 2
5 | 4 ³3 2

1 8 6 1/5
5 | 9 ⁴3 ³1

1 4 . 6
3 5 | 5 ¹⁶1 1 . ²¹0

Step nine

Children will be able to:
Long division

Abstract:
Children will use long division to divide numbers with up to 4 digits by 2 digit numbers.

015
32 | 487
-0
48
-32
167
-160
7

17 r 19
31 | 546
31
236
217
19