Hevingham
Primary School

Basic information

MATHEMATICS CALCULATION POLICY

Hevingham Primary school Partnership
May 2026

This policy covers our school's approach to teaching calculation in all year groups.
It was produced by the Maths lead and will be reviewed when required.
This policy runs in conjunction with our Mathematics Policy and our School Vision.

How will the policy be made available to parents

The policy will be available to parents through the school website, under the policies tab.

Our schools Vision

We will enable all our children to leave our school with the skills necessary to be successful learners, confident and healthy individuals and responsible citizens. They will have the necessary fluent calculating skills to be economically confident and able to develop their mathematical understanding further in Key Stage 3.

We will enable all our children to be confident enough to choose whether a formal calculation method is necessary, or if a mental calculation or jotting could complete the task more efficiently.

We will also encourage our children to find the ways maths can be a useful tool to become a responsible citizen by exploring how real-life maths can solve problems, improve people's lives and become and enjoyable part of peoples' career choices.

Introduction

This calculation policy has been amended to ensure children are confident and successfully able to calculate with fluency, having the skills to confidently apply it within other mathematical thinking and tasks. It provides guidance on appropriate calculation methods and progression. The content is set out in yearly blocks under the following headings: addition, subtraction, multiplication and division.

Children will be taught and are encouraged to use mental methods as their first option when appropriate, as these can be a swift way to find answers to many calculations. However, for calculations that they cannot do in their heads, they will need to use an efficient written method accurately and with confidence.

<u>When faced with a calculation problem, encourage children to ask:</u>

* Can I do this in my head?
* Can I do this using drawings or jottings?
* Do I need to use a written method?

Do I need concrete resources/manipulatives?

<u>Also, the children are encouraged to estimate and then check the answer -</u>

Encourage them to ask:
Is the answer sensible?

Aims of the policy

• To ensure consistency and progression in our approach to calculation
• To ensure that children develop an efficient, reliable, formal written method of calculation for all operations
• To ensure that children can use these methods accurately with confidence and understanding

Age/ stage expectations

The calculation policy is organised according to age stage expectations as set out in the National Curriculum 2014; **however, it is vital that pupils are taught according to the stage that they are currently working at.** Our teaching enables children to choose the calculating methods that are efficient and appropriate to their own level of learning, while giving them time to compare each and find which is best for them.
When the children are ready to use a more efficient or quick method, teaching will ensure a smooth and logical transition from one method to the next.

Providing breadth and depth of conceptual understanding

It is important that any type of calculation or mathematical concept is given time to be practiced, but of equal importance is the opportunity for children to explore the depth and breadth of that concept or calculation.

This is central to our maths teaching sequences, where our children are given the opportunities weekly to practise these methods; these calculation sessions also give children opportunity to choose their own challenge level to stretch or support their fluency development. Children are also enabled to apply them in most lessons, where problem solving and reasoning are a central part of the learning.

There are a wide variety of resources to support maths teaching, including calculations.

These include –

White Rose maths – a subscription we use to supplement our teaching materials
NCETM website
Nrich website

This policy also works in conjunction with an accompanying set of A3 calculation posters for children to refer to in the classrooms when calculating – teachers choose to either display **all** the age/ stage appropriate posters in the classroom, or could display the one or two operations which they're studying at the time to keep display space as relevant as possible.

Models and images: Our use of the number line in early calculating.

In our schools, we initially encourage children to use manipulatives for calculating, including gems, cubes, base-ten sticks and other fun items. When we begin teaching calculation, we begin with number lines to support their learning.

"Developing a number line is one of the strongest and most useful mental images in helping us to undertake mental calculations."

Koshy 1999

In order for children to develop efficient and accurate written methods, these mental images are essential. It is this conceptual understanding that underpins using more formal written methods, as stipulated in the National Curriculum.

There are several types of number line, all of which are used in the classroom to support understanding in mathematics. These can extend before zero into negatives, between integers to work with decimals, or expanding into a bar model to explore proportion and calculation further.

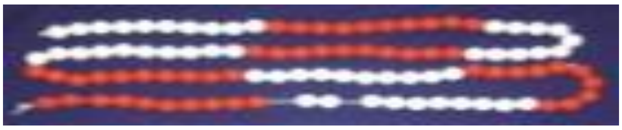
What are the benefits of using a number line?

- Develops a child's mental imagery
- Strongly develops sense/relationships of numbers
- Provides a progressive and consistent method of recording calculations
- Requires numbers to be selected for specific calculations
- Does not require different lines to be used in isolation i.e., bead string is linked to empty number line

- Underpins children's acquisition of basic facts
- Allows a child to demonstrate a range of calculation strategies
- Enables more efficient methods to be developed
- Requires only a piece of paper and a pencil

The empty number line

The empty number line has no numbers or intervals marked on it. It allows children to choose 'landmarks' to support their calculations. With young children we use 1-20 bead strings where the beads are grouped in 5's (5 red, 5 white etc) and then the children progress to a 1-100 bead string (10 red, 10 white)



To be able to use the empty number line successfully the children need to be confident in the following skills:

- Making jumps of different sizes
- Counting forwards and backwards
- Using complements of numbers to 10 (1+9, 2+8, 3+7 etc)
- Partitioning and re-combining numbers

These all form part of our maths teaching in the first term of each year.

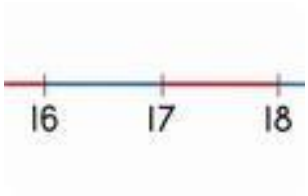
Number tracks

Number tracks are recognised as a helpful visual and physical tool for young children. They have numbers in spaces (often pictures or images i.e., carriages of a train) It is a track or number ladder with a sequence of numbers which start at 1. They can be vertical, horizontal or diagonal. They can zigzag like a 'snakes and ladders' or curve in a spiral. A 100 number square is a form of number track. We also use a number track clock to teach time concepts, where the number line is lifted from the clock face to model the progression of time.

Numbered lines

Numbered lines include 0 and are a development of the number track. Unlike the track, a numbered line has marks to indicate the position of numbers. The markings are regular and constant but the scale can change i.e., the interval can represent steps of 1, 10, 100, fractions, decimals, negative numbers so on.

Number lines, thought the initial stage of pictorial calculating, can therefore remain a valuable tool for children to develop their maths learning all the way through key stage 1and 2 e.g. converting between miles and kilometers on a scale. With a firm base of knowledge, children’s maths learning develops the concept of linear number to be applied in many different contexts.



Addition – progression

Children are taught to understand addition as combining two (or more) sets and counting on from one, adding on the next to find a sum.

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2 + 3 =?

At a party, I eat 2 cakes and my friend eats 3. How many cakes did we eat altogether?

Children could draw a picture to help them work out the answer, as well as manipulatives to support their concrete understanding.

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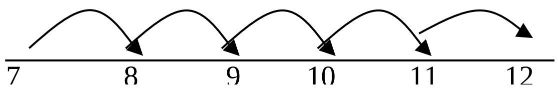
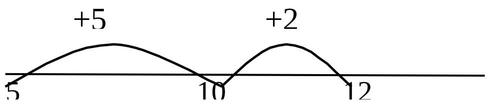
5 + 7 =?

I buy 5 pens from the newsagents and 7 from the supermarket. How many pens do I have altogether?





Children may be given a number line to draw on.

Draw a number line and count on in ones. Arrange 5 + 7 as 7 + 5 and count on 5 from 7

Begin to bridge through 10 and later 20.

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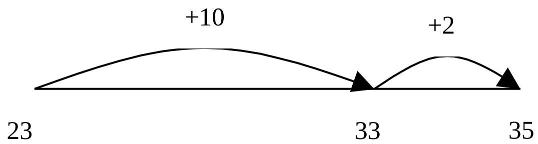
23 + 12 =?

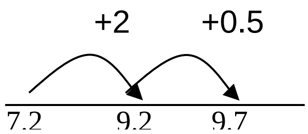
There are 23 people in the cinema and 12 arrive late. How many people are there in the cinema now?



Drawing an empty number line helps children to record the steps they have taken in a calculation. (Start on 23, + 10 then + 2)

Once children have really understood the place value of digits, they then progress to adding 3 digit numbers by partitioning their numbers further.

7.2 + 2.5 =?



Extend to decimals (same number of decimals places) and adding several numbers (with different numbers of digits).

Partitioning is key to introduce adding of decimal numbers.
This will also include bridging through one.

27 + 36 = ?
 	
  27
+ 36
  13   7 + 6
  50   20 + 30
  63
	When children are ready, move them onto using the expanded column method for addition.
	
	Partition the tens and ones, add them separately, and then add the two answers for your total.

127 + 136 = ?
 	
  127
+ 136
  263
   1
	If children are finding the expanded method slow when adding large numbers, it may be appropriate to bring in the compact written method for addition.
	
	This involved carrying large values into the higher column as you work across –
	In this example the **ten** from **6 + 7 = 13** is carried into the ten column underneath.

This efficient method is taught to be used for intergers, decimals and more than two numbers. We also teach the children that this efficient method does **not** need numbers which are of equal place value or number of digits.

Subtraction – progression

Children are taught to understand subtraction as taking away (counting back from the largest number by the small) and finding the difference (counting up from the small to the largest).

5 – 2 =?
I had five balloons. Two burst. How many did I have left?

Take away

Find the difference

A teddy bear costs £5 and a doll costs £2. How much **more** does the bear cost?

Drawing a picture helps children to visualise. Using dots or tally marks is quicker than drawing a detailed picture.
In these examples, when taking away it is encouraged to take away from the right hand side – as this is the side the larger number would be on a number line.

When finding the difference, the reverse is ideal.

9 – 6 =?

Mum baked 9 biscuits. I ate 6. How many were left?

1	2	**3**	4	5	6	7	8	9

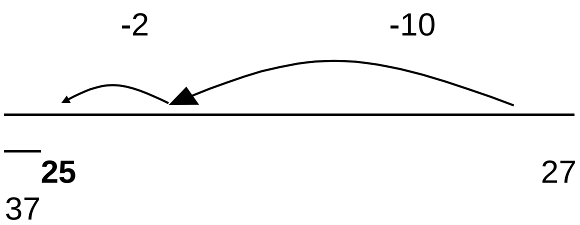
1	2	3	4	5	6	**7**	**8**	**9**

Children should use a completed number line or number track to solve subtraction. Both by counting back and finding the difference.
Encourage one to one matching with fingers,
Or using counters to keep track of where the children are counting.

Take away – start at nine and take away 6 – what number are you left with?

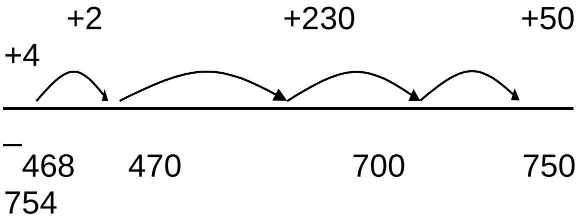
Finding the difference – start at 6 and count on until you get to 9.

37 – 12 =?
I cut 12cm off a ribbon measuring 37cm. How much is left?

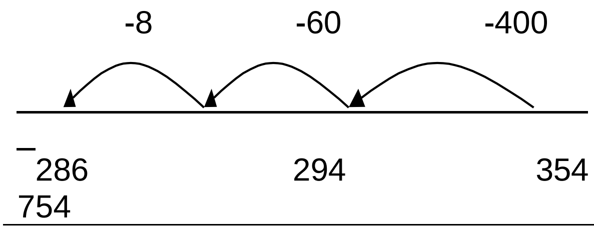


Children could count back using an empty number line. This is a really good way for them to record the steps they have taken. Start on 37 and work backwards, take away 10 and then, take away 2)
Extend to taking away multiples of 10. For example, 84 cm – 37cm. (Start on 84, -30, then -7)

754 - 468 =?



754 – 468 =?

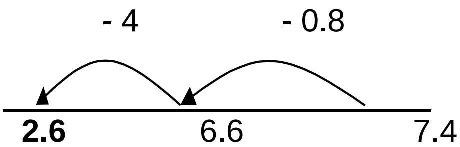


Children move on to 3 and 4 digit numbers and decimals using the same principles as above.

First example – Finding the difference by adding on from the smaller number.

Second example – taking away the small number from the larger number.

7.4 – 4.8 =?



Children move on to decimal numbers where they can count in logical steps.

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57 - 36 = ?

```
   57
-  36
    1
   20
   21
```

When children are ready, move them onto using the expanded column method for subtraction.

Take the lower ones from the upper ones, and then repeat for the tens.
Finally, add both of your subtraction answers together to find your answer.

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52 - 36 = ?

4 ~~5~~ **1**2	50 becomes 40,
- 3 6	2 ones becomes 12 ones.
6	12 - 6
1 0	40 – 30
1 6	

The next step for children would be exchanging to be able to subtract a big value from a smaller value.

For this example –
Taking 6 from 2 is difficult in this method.
Therefore, exchange one 10, and put it in the ones column.

---

227 - 136 = ?

1 ~~2~~ **1**2 7	200 into 100 (exchanging a 100)
- 1 3 6	and 20 becomes 120.
0 **9 1**	

= 91

If children are finding the expanded method slow when adding large numbers, it may be appropriate to bring in the compact written method for subtraction.

This involves exchanging smaller upper numbers if needed, as well as carrying larger values underneath the answer bar.

This example –
After exchanging a hundred across to make 120, first take 6 from 7 = 1

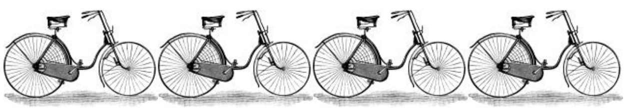
Next – take 30 from 120 = 90
Finally – 100 – 100 = 0.

Multiplication – progression

Children are taught to understand multiplication as a repeated addition and portioning to multiply. It can also be described as an array.

2 x 4 =?

Each bicycle has two wheels. How many wheels do four bicycles have?



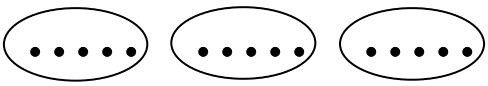
2 + 2 + 2 + 2

Use objects, counters, images, fingers, and any other resource available to encourage a wide and deep understanding of the concept of multiplication.

Re enforce the vocabulary of
lots of/groups of

5 x 3 =?

There are 5 cakes in a pack. How many cakes in 3 packs?



5 + 5 + 5

Dots or tally marks are often drawn in groups. This shows 3 lots of 5. Children would then count all of the dots together to find an answer and write it clearly.

They should also be encouraged count up in 5s or 3s to find the answer too.

4 x 3 =?

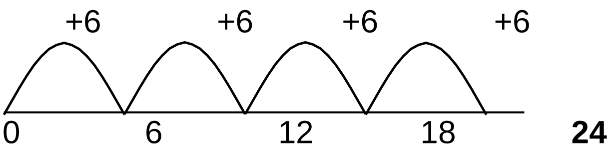
A chew costs 4p. How much do 3 chews cost?

●●●● ●●●
●●●● **or** ●●●
●●●● ●●●
●●●

Drawing an array (3 rows of 4 or 3 columns of 4) gives children an image of the answer. It also helps develop the understanding that multiplication is commutative – both 4 x 3 and 3 x 4 will give the same total.

6 x 4 =?

There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?

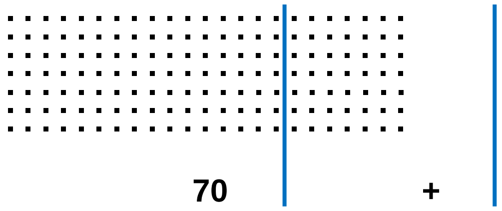


Children next count on in equal steps, recording each jump on an empty number line. This shows 4 jumps of 6. This is linked to the arrays created before – re enforcing the concept of multiplication being **repeated addition** (whether in cubes, dots, or on a number line).
6 has been added 4 times

23 x 7 =?
There are 23 biscuits in a packet. How many biscuits altogether in 7 packets?

23 = 10 + 10 + 3

	10	10	3
7	10 x 7 = **70**	10 x 7 = **70**	3 x 7 = **21**



70 + 70 + 21 = 161

When numbers get bigger it is inefficient to do lots of small jumps.
This interim method, called the 'grid method', is very closely linked to the array building work done in previous steps.

Once an array has been created or box has been drawn to represent 23 lots of 7 *(or the inverse),* two digit numbers are partitioned (see the **blue** lines).

23 has been partitioned into tens and ones. Each number is then multiplied by 7. The smaller answers are added to give the total answer.

72 x 38=
A shoelace is 72cm long. A rope is 38 times longer. How long is the rope?

	70	2
30	30 x 70 = 2100	30 x 2 = 60
8	8 x 70 = 560	8 x 2 = 16

Top row – 2100 + 60 = 2160
Next row – 560 + 16 = 576

Total = **<u>2736</u>**

This method also works for 'long multiplication'. Again, partition the numbers into tens and ones and multiply each separate section.

Again, encourage children to partition their 'array' proportionally.

This needs a good understanding of place value – 70 x 30 can be accessed using 7 x 3 but misconceptions around x 10, x 100 will need to be attended to.

Add across the rows, and then add those two answers together.

This method can be used in the same way when multiplying larger numbers such as 327 x 24.
Partition the hundreds, tens and ones into a larger 3 x 3 grid.

72 x 38=
A shoelace is 72cm long. A rope is 34 times longer. How long is the rope?

```
  72
X 38
  16    2 x 8
```

When children are ready, move onto using the **expanded** method for multiplication.

This is a column method, but is very closely linked to the grid method shown in the previous step.

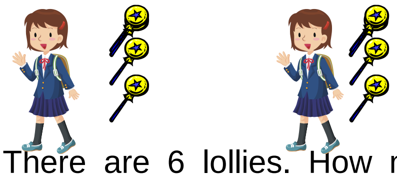
60 2 x 30 560 70 x 8 2100 70 x 30 **2736**	Each partitioned value is multiplied by the opposite, exactly as in the grid method. Each separate answer is written underneath the calculation, and then totalled.
72 x 8 =? A car is 72cm long. A train is 8 times longer. How long is the train? 72 X 8 576 1	Then on to the compact short method of multiplication. This is shown to the left – where the expanded answers in the previous step are combined quickly using the carrying form column addition.
44 x 27 =? 44 X 27 2 308 44 x 7 (4x7 + 40x7) = 308 880 44 x 20 (20x4 + 20x40) = 880 **1188**	Next, when children have mastered the expanded method of multiplication, and the compact short method, move on to the compact long multiplication. This involves two sets of short compact, and adding the totals together using column addition. This version has carrying in the intermediate answers, as well as the possibility for carrying during the addition too.

Division

Children are taught to understand division as sharing and grouping

6 ÷ 2 =

6 lollies are shared between 2 children. How many lollies does each child get?



Sharing between 2

There are 6 lollies. How many children can have two each?

grouping in 2's

Drawing gives the children an excellent starter in sharing objects or dots into equal group.
This includes one to one matching, and sharing each items slowly.

Sharing - sharing the total number by the divisor – six shared into two separate lots.

Grouping – Finding how many groups of the divisor in the total number –
How many groups of two in 6.

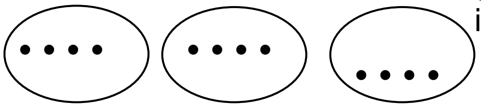
12 ÷ 4 =?

12 apples are shared equally between 4 baskets. How many apples are in each basket?

III	III
III	III

sharing between 4

4 apples are packed in a basket. How many baskets can you fill with 12 apples?



grouping in 4's

Dots or tally marks can either be shared out one at a time or split into groups.

Again, teach the difference between grouping and sharing, and teach both methods.

18 ÷ 3 =?

5 1	5 1	5 1

How many in each group?

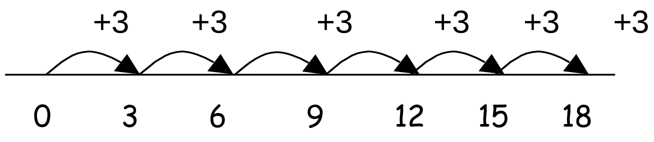
The next step in sharing would be using a grid method to organise small sharing.

To make the method quicker than sharing one at a time, children are encouraged to share out larger numbers until they reach the total number.

18 ÷ 3 =?

A chew bar costs 3p. How many can I buy with 18p?

How many groups of three in 18?

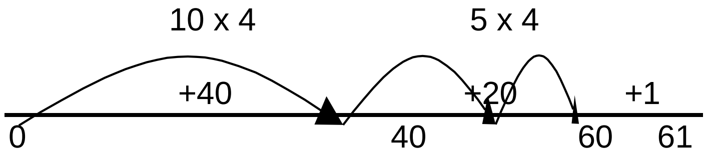


Next, children will be encouraged to use a number line for grouping.

61 ÷ 4 =?

I need 4 drawing pins to put up a picture. How many pictures can I put up with 61 pins?

61÷4 = 15 r1 or 15¼ or 15.25



15 groups of 4 with 1 remaining.

As children take on larger number to divide, the idea of remainders is taught.

This also includes 'chunking' to save time. It would take a long time to jump in 4's to 61 so children can jump on in bigger 'chunks'.

A jump of 10 lots of 4 takes you to 40. Then you need another 5 lots of 4 to make 60. Altogether that is 15 fours with 1 left over (remainder 1 or r1, ¼ or 0.25)

We would normally write 15r1 in this case.

60 ÷ 4 =?

How many 4s in 60?

1 5= **15**
4)6 ²0

When children are comfortable dividing larger 3 digit numbers, introduce the 'bus stop' method for division, as the method is much quicker.

This example –

Using digit value, we find how many groups of 4 can we get in 6 = **1 group**

How many remaining = 2

The remaining 2 (twenty) move to the ones column. How many groups of 4 in 20 = 5

61 ÷ 4 =?

Next – use the bus stop method to

4)6 ²1 → 1 5 r1 = **15r1**	highlight and divide when remainders arise using the same method – any remaining move to the next column along.
245 ÷ 8 =? ***How many groups of 8 in 245?*** 8)2 ²4 5 → 0 3 0 r5	When children are comfortable with the layout of a 'bus stop' arrangement, children can use the compact division method using exchanging to divide larger numbers. The discussion would go as follows – *How many 8s in 2?* ***Zero. Carry the 2 forward.*** *How many 8s in 24?* ***3.*** *How many 8s in 5?* ***Zero. Carry the 5 – remainder.*** **Answer – <u>30 r 5</u>**
245 ÷ 8 =? ***How many kilograms of sand in 8 sacks if the total is 245 kg altogether?*** 8)2 ²4 5 . ⁵0 ²0 ⁴0 → 0 3 0 . 6 2 5	This efficient method can also be used to find decimal answers, and they're encouraged to use this method when a specific answer is needed, dividing grams of ingredients for example. The discussion would go as follows after the discussion in the previous example – *…How many 8s in 5?* ***Zero. Carry the 5 forward into the decimals.*** *How many 8s in 50?* ***6 with 2 remaining.*** ***Carry the 2 forward.*** *How many 8s in 20?* ***2 with 4 remaining.*** ***Carry the 4 forward.*** *How many 8s in 40?* ***5.*** **Answer – 30.625**