

Littleport Community Primary School



Calculation Policy

Calculation Policy

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

This document is designed to support staff and governors at Littleport Community Primary School in understanding the progression through calculation. It should be referred to when planning lessons and interventions. Parents will be provided with a simplified document focusing on the key strategies.

Children should be encouraged to develop mental calculation skills alongside written methods and become increasingly confident at choosing the most appropriate method for that calculation. See *Teaching Children to Calculate Mentally* for additional support on developing mental calculation skills.

When being introduced to a new concept, children should always see and use concrete and pictorial examples before moving on to abstract calculations.

There is a great deal of overlap between calculations used in Year 1 and 2, Year 3 and 4 and Year 5 and 6 which has informed the structure of this document. Children should initially work with simpler numbers (for example, no exchanging) before developing the method with more complex numbers. Some children may need to use methods from the years below them. However, children should not move on to methods from the year above them but instead have their experience widened through problems solving and a range of contexts.

Regular use ~~of~~ and repetition throughout the year will support children with recall of these key methods.

Addition

Key Vocabulary

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

EYFS

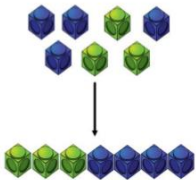
Children are introduced to number for number recognition and to support with:

- Identifying one more
- Combining pieces to add
- Finding number bonds within ten (e.g. finding different ways to make 8)
- Adding without counting on



Children begin to combine groups of objects using concrete apparatus

Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars).



Children are encouraged to read and construct number sentences aloud, saying them in different ways.
"Three add two equals five." "Five is equal to two add three."

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

Formatted: Font: 20 pt

Formatted: No underline, Font color: Blue

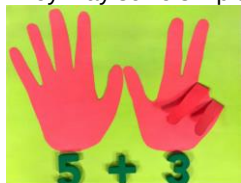
Formatted: No underline, Font color: Blue

Formatted: No underline, Font color: Blue

Formatted: No underline, Font color: Blue

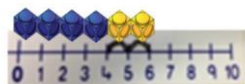
Formatted: No underline, Font color: Blue

They may solve simple problems using fingers (but should be encouraged to learn number bonds rather than relying on this).



Number lines and number tracks may be used to support with finding one more and counting on.

Counting on using number lines using cubes or Numicon.



Children will need opportunities to look at and talk about different models and images as they move between representations.

As children become more familiar with numbers, they are encouraged to subitise. For example, once children subitise to 6, they see 5 and 1, 2 and 4, 3 and 3. This is building a sense of the 'sixness of six' as well as introducing number bonds. This is best explored through play so children are presented with numbers as more than numerals or dots on a dice.

For example, the EYFS practitioner might provide opportunities for children to see numbers up to five in many other less organised arrangements, and to talk to children about the groups of smaller numbers they 'see' within the bigger numbers. For example, a child might be encouraged to throw four two-sided beanbags and see how many land red side up and how many blue.

Separation and recombining is a more effective calculation strategy than 'counting on' or 'counting back'.

Children will need opportunities to look at and talk about different models and images as they move between representations.

Formatted: Font: (Default) Arial

Formatted: Font color: Auto

Year 1 and 2

Number bonds

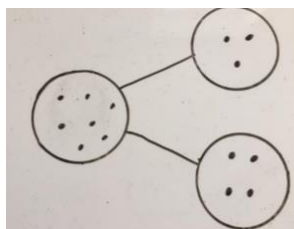
Children in **Year 1** need to know the pairs of numbers that add [together](#) to make the numbers up to and including 10. They should know these off by heart and recall them instantly. They should be practised regularly ~~and given opportunities to practise them~~[within](#) in a range of contexts.

For example, number bonds to 5 are 0 + 5 1 + 4 2 + 3 3 + 2 4 + 1 5 + 0.

Number bonds to 10 are 0+10 1+9 2+8 3+7 4+6 5+5 6+4 7+3 8+2 9+1 10+0

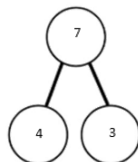
Children in **Year 2** should be fluent in number bonds up to and including 20 and use these to support working up to 100.

Children still work with practical equipment such as cubes and numicon. They represent addition using part-whole models.



$$4 + 3 = 7$$

Four is a part, 3 is a part and the whole is seven.



They record number sentences and vary the position of the equal sign.

$$4 + 3 = 7$$

$$3 + 4 = 7$$

$$7 = 3 + 4$$

$$7 = 4 + 3$$

They also use their knowledge of number facts to help solve missing number problems

$$3 + \square = 7$$

Calculation Policy

Although we do not encourage the use of a number line for their own calculation, they must still be exposed to them as another representation of addition.

The abstract number line:

What is 2 more than 4?

What is the sum of 2 and 4?

What is the total of 4 and 2?

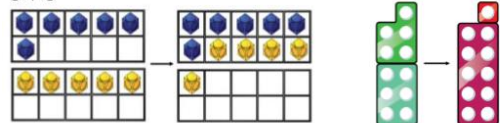
$$4 + 2$$



They begin to develop their understanding of regrouping to make 10.

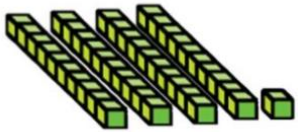
Regrouping to make 10; using ten frames and counters/cubes or using Numicon.

$$6 + 5$$

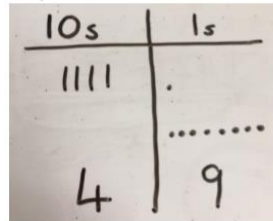


As their understanding develops, they will start using tens and ones apparatus (dienes) to represent addition before moving on to draw their own representations. The units are added first in preparation for later methods.

TO + O using base 10. Continue to develop understanding of partitioning and place value.
 $41 + 8$



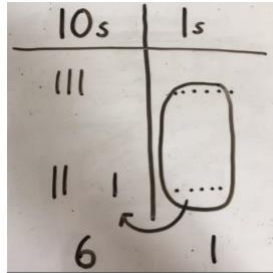
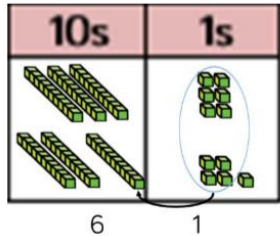
Children to represent the base 10 e.g. lines for tens and dot/crosses for ones.



Children in Year 2 will work with two 2-digit numbers, including regrouping across 10.

Calculation Policy

TO + TO using base 10. Continue to develop understanding of partitioning and place value.
 $36 + 25$



Year 3 and 4

Children continue to build on mental calculation skills and learn to decide when a written method is required. For 2 digit numbers, they are encouraged to partition and add mentally or with jottings.

For calculations requiring the written method, they begin with expanded addition.

Calculation Policy

	H	T	U
	2	7	4
+	3	8	7
		1	1
	1	5	0
	5	0	0
	6	6	1

Units are always added first – this prepares children for compact addition.

Children are introduced to compact addition through concrete and pictorial representations.

Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.

100s	10s	1s
6	1	1

100s	10s	1s
6	1	1

Calculation Policy

$$\begin{array}{r}
 \text{H} \quad \text{T} \quad \text{U} \\
 2 \quad 7 \quad 4 \\
 + 3 \quad 8 \quad 7 \\
 \hline
 6 \quad 6 \quad 1 \\
 \hline
 1 \quad 1 \quad
 \end{array}$$

Children are still encouraged to use mental addition skills to support. For example, recognising that $7 + 3 = 10$ so $7 + 4 = 11$ and $7 + 7 = 14$ so $7 + 8 = 15$ (near doubles).

Year 5 and 6

Children apply their mental and written skills to a range of addition questions, including 5 and 6 digit numbers and decimals. They are confident using the compact method where appropriate.

$$\begin{array}{r}
 15.68 \\
 + 27.86 \\
 \hline
 11.1 \\
 \hline
 43.54
 \end{array}$$

$$\begin{array}{r}
 3 \quad 2 \quad 7 \quad \square \\
 + \quad 8 \quad \square \quad 8 \\
 \hline
 4 \quad 1 \quad 7 \quad 5
 \end{array}$$

They use their understanding of the compact method and exchanging to solve increasingly complex missing number questions.

Subtraction

Key Vocabulary

take away, less than, the difference, subtract, minus, fewer, decrease, 'how many left?'

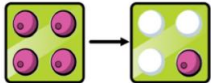
For KS2, please be careful to clarify that we 'put the bigger number at the top' because we do not want to end up with a minus/negative number. For example, avoid saying we cannot do $4 - 6$ as it is possible. Instead, remind them that we want a positive answer, therefore we must start with the larger number.

EYFS

Children start with concrete apparatus, counting or recognising how many they have before physically removing some and seeing how many are left.

Physically taking away and removing objects from a whole
(ten frames, Numicon, cubes and other items such as beanbags could be used).

$$4 - 3 = 1$$



Children are encouraged to read and construct number sentences aloud, saying them in different ways.
"four subtract three equals ones." "one is equal to four subtract three."

Formatted: Font: 20 pt

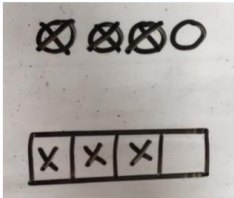
Formatted: No underline, Font color: Blue

Formatted: Font: Not Bold, No underline, Font color: Blue

Calculation Policy

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

Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.

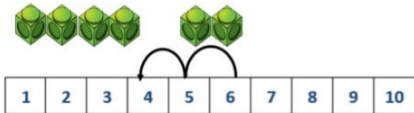


They may solve simple problems using fingers (but should be encouraged to learn number bonds rather than relying on this).

Number lines and number tracks may be used to support with finding one less and counting back.

Counting back (using number lines or number tracks)
children start with 6 and count back 2.

$$6 - 2 = 4$$



Children will need opportunities to look at and talk about different models and images as they move between representations.

Formatted: Font: 12 pt

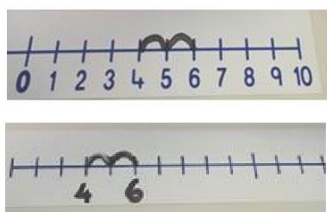
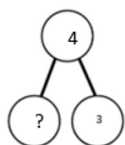
Year 1 and 2

Children make links to the number bonds they know and the inverse relationship between addition and subtraction. Part-whole models and bar models support their developing understanding.

$4 - 3 =$

$\square = 4 - 3$

4	
3	?

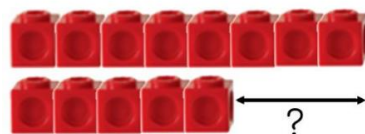


Although we do not encourage the use of number lines for their own calculation, children should still be exposed to them as another representation of subtraction. It is sometimes more useful to count up or back on a mental/physical numberline if numbers are close together.

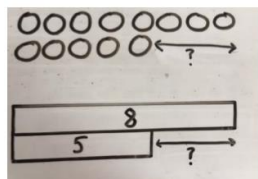
A key concept to develop at this stage is the idea of **'finding the difference.'**

Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used).

Calculate the difference between 8 and 5.



Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate.



Find the difference between 8 and 5.

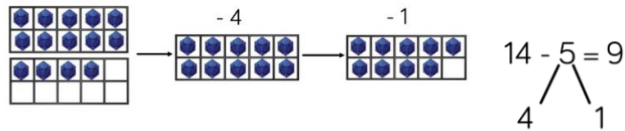
$8 - 5$, the difference is $\square$

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

Concrete resources should be used to develop children's concept of partitioning to support mental subtraction. For example, the concept of how many to subtract to get to the nearest 10.

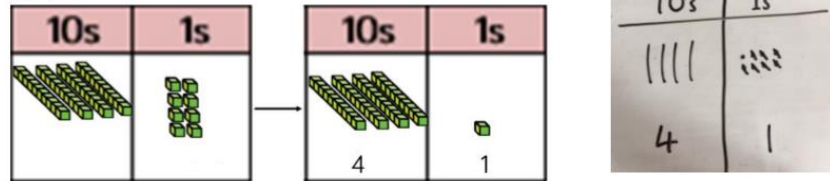
Making 10 using ten frames.
14 - 5

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



As with addition, children represent subtraction using concrete tens and ones apparatus (dienes) before moving to drawing representations of tens and ones.

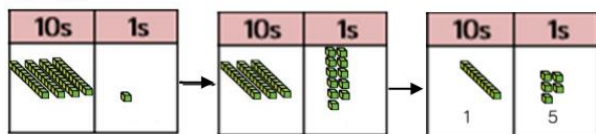
48-7



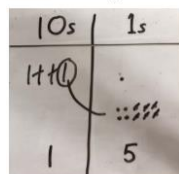
They move to exchanging ten using tens and ones apparatus before representing by drawing.

Calculation Policy

Column method using base 10 and having to exchange.
41 – 26



Represent the base 10 pictorially, remembering to show the exchange.



Year 3 and 4

Children are encouraged to use mental maths where appropriate. Where written methods are required, they move to expanded subtraction.

$$398 - 124 =$$

$$\begin{array}{r} 300 + 90 + 8 \\ - 100 + 20 + 4 \\ \hline 200 + 70 + 4 \end{array}$$

Remember to subtract the units first!

Once confident, they move to exchanging or regrouping ten.

$$345 - 128 =$$

$$\begin{array}{r} 300 + \overset{30}{\cancel{40}} + 15 \\ - 100 + 20 + 8 \\ \hline 200 + 10 + 7 \end{array}$$

Please refer to it as **exchanging** or **regrouping** ten – not borrowing as this implies you'll give the ten back!

In Year 4, some children may move to the compact method if their understanding of exchanging is secure.

Year 5 and 6

Children apply their mental and written skills to a range of addition questions, including 5 and 6 digit numbers and decimals. They use the compact method where required. They become confident exchanging across a number of places. They use their understanding of column subtraction to solve missing number calculations.

Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because $41 = 30 + 11$.

$$\begin{array}{r} \overset{3}{\cancel{4}} \overset{1}{1} \\ - 26 \\ \hline 15 \end{array}$$

$$\begin{array}{r} \overset{2}{3} \overset{13}{.4} \overset{17}{7} \\ - 1.59 \\ \hline 1.88 \end{array}$$

$$\begin{array}{r} \boxed{8,000} \\ - 3,644 \\ \hline 4,356 \end{array}$$

$$\begin{array}{r} \boxed{6} \boxed{} \boxed{3} \boxed{} \\ - \boxed{} \boxed{2} \boxed{} \boxed{7} \\ \hline \boxed{5} \boxed{1} \boxed{8} \boxed{1} \end{array}$$

Multiplication

See also Multiplication Tables section for approach to teaching tables.

Key Vocabulary

double, times, multiplied by, multiple, the product of, groups of, lots of, equal groups.

EYFS

To meet the learning goal, children should be able to solve problems involving doubling. They should have opportunities to practise this with a range of equipment, in a range of contexts. For example, going shopping and needing to buy double amounts of objects for two people.

To meet the exceeding goal, children solve practical problems that involve combining groups of 2, 5 or 10.

Year 1 and 2

Children start with a range of practical objects including cubes, counters and compare bears.

Formatted: Font: 20 pt

Formatted: No underline, Font color: Blue

Formatted: No underline, Font color: Blue

Formatted: No underline, Font color: Blue

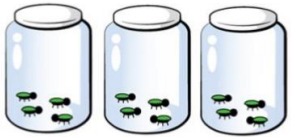
Calculation Policy

Repeated grouping/repeated addition

$$3 \times 4$$

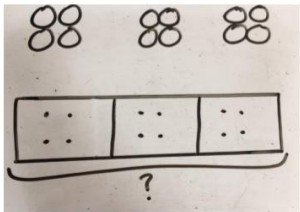
$$4 + 4 + 4$$

There are 3 equal groups, with 4 in each group.



They use pictures and the bar model to represent their understanding. As children become more confident with their multiplication tables knowledge, they use numbers rather than dots. Children are encouraged to use mental calculation skills where this is more appropriate.

Children to represent the practical resources in a picture and use a bar model.



12		
4	4	4

Although we do not encourage the use of number lines for their own calculation, children must be exposed to them as another way of representing multiplication.

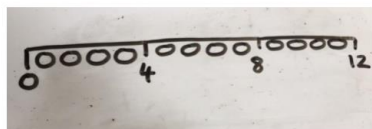
Calculation Policy

Number lines to show repeated groups-
 3×4



Cuisenaire rods can be used too.

Represent this pictorially alongside a number line e.g.:



Abstract number line showing three jumps of four.

$$3 \times 4 = 12$$



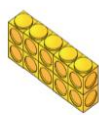
They should also have experience of arrays to support their understanding of the commutativity of multiplication ($2 \times 3 = 6$ and $3 \times 2 = 6$).

Use arrays to illustrate commutativity counters and other objects can also be used.

$$2 \times 5 = 5 \times 2$$

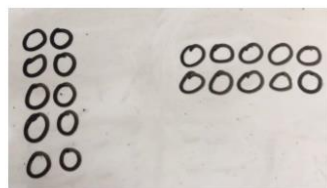


2 lots of 5



5 lots of 2

Children to represent the arrays pictorially.



Children to be able to use an array to write a range of calculations e.g.

$$10 = 2 \times 5$$

$$5 \times 2 = 10$$

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

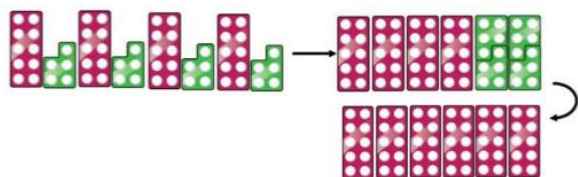
$$10 = 5 + 5$$

Year 3 and 4

By the end of Year 4, children should know their multiplication tables up to 12×12 . Therefore it is important to encourage recall and mental maths whenever possible. Children should be supported to decide which calculations require a written method and which may be done mentally or with jottings (for example, smile multiplication).

They develop their knowledge of partitioning through use of practical equipment.

Partition to multiply using Numicon, base 10 or Cuisenaire rods.
 4×15



They develop a written method referred to as the grid method. Partitioning the number and multiplying each part. They use their knowledge of tables to support them. They add the multiples (either mentally or using an appropriate written method) to find the answer.

$$43 \times 8 =$$

X	40	3
8	320	24

Partition 43.
 Use $8 \times 4 = 32$ to find $8 \times 40 = 320$.
 Add $320 + 24$ using an appropriate method.

In Year 4, with a good understanding of the grid method, children begin to move to the expanded column method. They compare the methods alongside each other to support this process.

Calculation Policy

Grid:

$$\begin{array}{r} 215 \times 6 \\ \times 200 \quad 105 \\ \hline 61200 \quad 6030 \\ \hline 1,200 + 60 + 30 = 1,290 \end{array}$$

Column:

$$\begin{array}{r} 215 \\ \times 6 \\ \hline 30 \quad (5 \times 6) \\ 60 \quad (10 \times 6) \\ 1,200 \quad (200 \times 6) \\ \hline 1,290 \end{array}$$

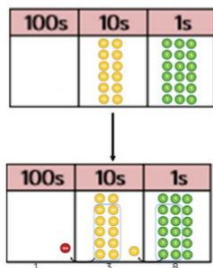
Year 5 and 6

Children continue to revise multiplication tables up to 12×12 . They are encouraged to switch between tables and recall instantly.

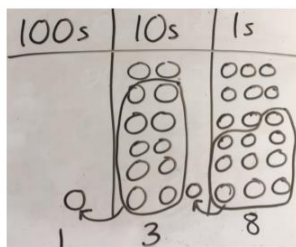
They use the short form of column multiplication. Regrouping should be modelled using place value counters and some children may benefit from using drawings to support their understanding before moving to the written method.

Calculation Policy

Formal column method with place value counters.
6 x 23



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



Formal written method

$$\begin{array}{r} 6 \times 23 = \\ 23 \\ \times 6 \\ \hline 138 \\ 1 \quad 1 \end{array}$$

Children in Year 5 and 6 must also use the formal method of long multiplication for 2 digit x 3 digit and 2 digit by 4 digit. They must develop their understanding of why a place holder is required. Modelling partitioning and the grid method alongside can support understanding.

$$\begin{array}{r} 27 \\ \times 52 \\ \hline 54 \\ + 1350 \\ \hline 1404 \end{array}$$

$$\begin{array}{r} 8635 \\ \times 46 \\ \hline 51810 \\ \hline 345400 \\ \hline 397210 \end{array}$$

Division

Formatted: Font: 20 pt

The number which is divided is called the **dividend**.

The number by which it divides is called the **divisor**.

The number which is the result of the division is called the **quotient**.

Therefore, $\text{dividend} \div \text{divisor} = \text{quotient}$.

If there is any number left over, it is called the **remainder**.

Key Vocabulary

share, group, divide, divided by, half

Formatted: No underline, Font color: Blue

The number which is divided is called the **dividend**.

Formatted: Font: 12 pt, Font color: Blue

The number by which it divides is called the **divisor**.

The number which is the result of the division is called the **quotient**.

Therefore, $\text{dividend} \div \text{divisor} = \text{quotient}$.

If there is any number left over, it is called the **remainder**.

Formatted: No underline, Font color: Blue

EYFS

To meet the learning goal, children should solve practical problems using equipment and in different contexts. They should also be exposed to the example, halving pieces of paper or looking at bottles half-filled with



involving halving and sharing using a range of vocabulary of halving in other contexts. For liquid.

To meet the exceeding goal, children should solve practical problems using equal groups.

involving sharing into different numbers of

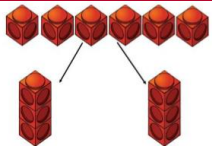


'Half the apples for me, half the apples for you.'

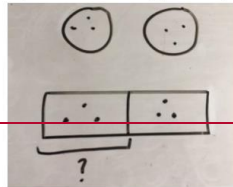
Year 1 and 2

Children continue to work with concrete examples to ensure understanding. They move to representing their work using the bar model. Initially they use dots to share but are encouraged, where appropriate, to use their knowledge of multiplication tables.

Sharing using a range of objects.
 $6 \div 2$



Represent the sharing pictorially.



$6 \div 2 = 3$

$$6 \div 2 = 3$$

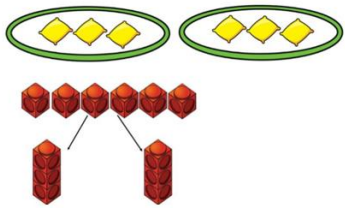
6	
3	3

Children are encouraged to use their 2 x table facts

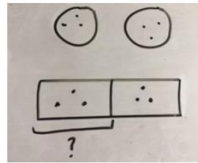
Formatted: Font: (Default) Arial, 10 pt

Calculation Policy

Sharing using a range of objects.
 $6 \div 2$

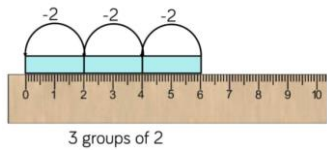


Represent the sharing pictorially.



Although we do not encourage the use of number lines for division, it is useful for children to be aware of them as another way of representing this calculation.

Repeated subtraction using Cuisenaire rods above a ruler.
 $6 \div 2$



Year 3 and 4

For smaller numbers, children may still use the bar model to represent their thinking. They are also encouraged to recognise and use

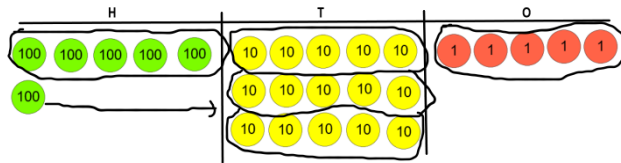
multiplication facts whenever possible. For example, $30 \div 3$ does not require a written method because we know $10 \times 3 = 30$.

For larger numbers children begin to use the grid. It is important to point out to children that division is the only one of our calculation methods in which we start from the left hand side.

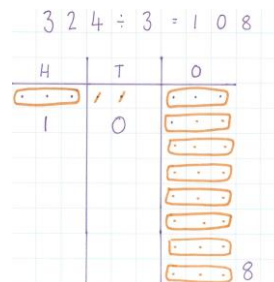
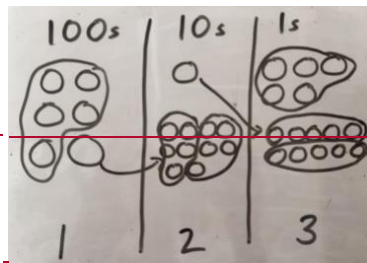
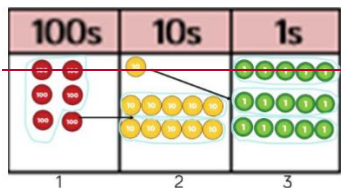
Where available, they use hundreds, tens and ones counters initially. ~~Counters are circled in groups of the number they are being divided by. The divisor in this case is 5 so they are circled in groups of 5. When a counter does not fit into one of the equal groups, it is exchanged and regrouped to the next column. Children move to representing these calculations by drawing.~~

~~Counters are circled in groups of the number they are being divided by. To make this easier, draw or place the counters in rows of the number you are dividing by. The divisor in this case is 5 so draw them in rows of 5 and then circle them in groups of 5. When a counter does not fit into one of the equal groups, it is exchanged and regrouped to the next column. Children move to representing these calculations by drawing.~~

655 ÷ 5



Short division using place value counters to group.
 $615 \div 5$



Formatted: Font color: Black

Formatted: Adjust space between Latin and Asian text,
Adjust space between Asian text and numbers

Calculation Policy

Children in Year 4 may move on to the 'bus stop' method of short division. If another model is ~~used~~ required to support their understanding, numicon can be used (see video clips).

<https://www.youtube.com/watch?v=dRX7XCGmRRo>

<https://bottesfordjunior.primarysite.media/media/division-using-numicon>

$$\begin{array}{r} 123 \\ 5 \overline{) 615} \\ \underline{5} \\ 115 \\ \underline{105} \\ 10 \end{array}$$

$$\begin{array}{r} 123 \\ 5 \overline{) 615} \\ \underline{5} \\ 115 \\ \underline{105} \\ 10 \end{array}$$

Year 5 and 6

Children are encouraged to identify which calculations can use multiplication tables knowledge and which require a written method. For example, $720 \div 6$ does not require a written method because children should recognise that $72 \div 6 = 9$ so $720 \div 6 = 90$.

Where a written method is required, children use the 'bus stop.' Some children may have moved on to this in year 4.

$$\begin{array}{r} 123 \\ 5 \overline{) 615} \\ \underline{5} \\ 115 \\ \underline{105} \\ 10 \end{array}$$

The 'bus stop' is also used for ~~long division~~ calculations where the divisor has two digits. Mistakes are often made when working out the multiples of the divisor so children are encouraged to partition to calculate – this should be practised as a separate skill before beginning long division.

[illegible]

Multiplication Tables

As stated in the aims of the National Curriculum, children should become fluent in the fundamentals of mathematics. Multiplication tables are an important aspect of that. Being able to fluently recall multiplication facts reduces cognitive load in larger calculations and problem solving.

EYFS - early counting skills – including 1-1 correspondence and grouping objects - underpin the development of multiplication tables.

Year 1 - count in 2s, 5s and 10s

Year 2 - recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
Count in 3s

Year 3 - count from 0 in multiples of 4, 8, 50 and 100; recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Year 4 - count in multiples of 6, 7, 9, 25 and 1000; recall multiplication and division facts for multiplication tables up to 12×12

Formatted: Font: 20 pt, Bold, Underline

Formatted: Centered

Formatted: Centered

Formatted: Font: 12 pt

Calculation Policy

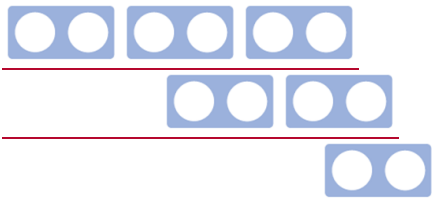
Year 5 and 6 – continue to regularly practise and recall multiplication and division facts for multiplication tables up to 12×12

Below is a structured approach for the teaching of multiplication tables. There should be daily, focused practise. Please note that some children may need to work on a multiplication table below their year group but should still receive daily, supported practice on this.

Stage 1

Counting with physical objects. It's better if these are things in the correct number already so numicon is ideal! Can be modelled by adult where equipment is limited but even better if can be done by children in pairs/groups.

Children should see that two groups is double one group etc. You can use other numbers to overlay, for example, placing the four over the two x two or using ten and two with the twelves to show we're counting on 10 then 2 more or nine as one less than 10.



They could write post-its with the multiple underneath. Don't forget 0!

This is also a good time to explore patterns/notice rules about the multiplication table you're studying.

- 2x table – doubles, always even

Formatted: Centered

Calculation Policy

- 3s,5s,7s,9,11s – why we get even numbers when we multiply by an even number
- 5s – only ending in 5 and 10
- 9s – because we can look at adding ten and taking away 1 we can see the units decreasing and the tens increasing. The answers also add to 9 e.g
 $2 \times 9 = 18$ and $1 + 8 = 9$, $3 \times 9 = 27$ and $2 + 7 = 9$
- There's a repeated pattern in the units of the 8x table

Physical representation also points out why we call them square numbers

Stage 2

Counting with pictorial representations – good idea to start with numicon as this is a familiar concept from the counting physical objects.

There may be another appropriate image to support your multiplication table. For example hands work well for 5s and 10s.

Explore patterns on multiplication squares.

Moving to the bar model is a good bridge between pictorial and abstract and supports with the links between multiplication and division that children can explore as they gain confidence.

Stage 3

Focus on counting up and down from 0x and 12x initially before moving to counting from any multiple.

Counting stick is great – however, children do need up to twelve x.

<https://mathsbot.com/manipulatives/countingStick>

Physical actions can make it fun e.g. hopping from foot to foot.

I say, you say

Lots of youtube videos with times table songs focus on counting.

Stage 4

Learning times table facts. Important to link back to concrete resources or at least pictorial representation. Keeping track of the tables you know on a multiplication square is also a great idea.

This can be done with discussion with the children to identify which ones are the easiest to learn/which ones we know from previous tables work. Take two or three facts for a day. Check them the next day. If they don't know them, don't move on. Before adding new facts, always recap the facts you know through mini whiteboard checks, bingo etc. Keep looking back at number line to see what you know now. **Make it clear that we need to know these number facts. Model the quicker strategies to find them and avoid counting up from 1x if you're**

Field Code Changed

Calculation Policy

trying to get to 8x etc.

Practise them as often as possible – just before lining up, when they come to the carpet etc. Ideally we all know the facts off by heart but if not, we need more efficient strategies than counting right from the beginning.

Start with 1x, 2x and 10x. Reinforce the key concept of doubling for 2x and the key concept of moving place value and needing a place holder for 10x (not just adding zero!).

Look at 1 x? and how that's the same as ? x1. Reinforce commutative properties throughout.

Move to 4x and 5x

Link 4x to double 2x. Link 5x to half of 10x.

Move to 3x and 6x

Link these as doubles. Also remind that if we know 2x, we can use this to help us with 3x if we're stuck. If we know 5x, we can use this to help with 6x if we are stuck. I can never remember 6x8 but can do $5 \times 8 = 40 + 8$ which is more useful than counting up from 8. Important to model these thought processes to children.

Move to 9x and 11x

Look back at 10x. 9x is one lot less. Look at how knowing 10×7 is 70 helps if we're stuck with 9×7 . We need $70 - 7$ and we know $7 + 3 = 10$ so units must be three and it must be 60 so 63. This also reinforces number bonds. 11x table has a lovely pattern because it's $10x + 1x$.

Move to 8x and 7x

8x can be linked to 4x and doubling. 7x is one of the hardest to learn as there is no real pattern. If really stuck, can use 5x and 2x. Little things like 42 being the answer to everything and $56 = 7 \times 8$ matching the Steps song 5,6,7,8 can help answers stick in children's heads.

12x

If children are familiar with counting in multiples of your number, they will often remember this because it's the biggest/the top of the numbers. If stuck, it's easy to use 10x and 2x to quickly work it out.

Practise the table as a whole

Don't move on straight away – spend some time practising your multiplication table as a whole e.g. play games/ have mini contests/ use the iPads.

Applying and retaining

Calculation Policy

Very easy to see learning multiplication tables as an abstract concept so where possible build the table into your other maths work e.g. **through fact families**, multiplication and division word problems.
When teaching a new multiplication table, make sure there are opportunities to practise the previous one. For example in early morning work, a two minute table challenge, a quick whiteboard game etc. Mixed Bingo is a good way for children to have to work with two times tables at once.