## Maths Parent Workshop

- What we Teach, How we Teach it November 2022


## Multiplication and Division

## Year 2, Year 3 and Year 4

## Concrete, Pictorial, Abstract

The children's understanding of the calculation strategies that they are taught through school will be underpinned by a secure understanding of place value. At Lindow Community we teach through a CPA (concrete, pictorial, abstract) approach.

Understanding in all areas of maths will be developed by children using concrete resources and interpreting and using pictorial representations before moving onto solve abstract calculations.

There are a range of place value and counting resources available for the children to use in each classrgom. The CPA process/approach will be clearly exemplified on maths working walls for the


## Useful Resources

Concrete resources are VITAL in the children's early understanding of number and calculation.


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National Curriculum Objectives:
Multiplication objectives from Multiplication and Division Strand

- Recall and use multiplication facts for the 2,5 and 10 times tables.
- Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication signs and equals signs.
Show that the multiplication of two numbers can be done in any order. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication facts, including


## Key Skills/ other linked NC Objectives (Place Value)

- Recognise odd and even numbers.
- Count in steps of 2,3 and 5 from zero and in 10s from any number.

Year 1 vocab plus
Array, multiplied by, repeated addition,

Two times, three times, five times, ten times

In year 2, the children will:

- Develop their understanding of multiplication through the use of practical resources
- and pictorial representations.
- Multiply using arrays and repeated addition.


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## Written Methods

Step 1: Practical Apparatus
Children continue to explore multiplication through use of real -life problems using a range of practical equipment.

$5 \times 3=5+5+5$

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## Written Methods

## Step 2: Arrays

Use arrays to help teach the children that multiplication can be done in anv order and explore examples such as 3 X... $=15$


$$
\begin{aligned}
& 3+3+3+3+3=15 \\
& 3 \times 5=15
\end{aligned}
$$

$$
\begin{aligned}
& 5+5+5=15 \\
& 5 \times 3=15
\end{aligned}
$$



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## Written Methods

Step 3: Repeated Addition on a number line

Children start from 0 and make equal jumps on a number line in order to work our multiplication facts and write multinliratinn statements using $x$ and $=$ symbols.


## Mental Methods

Counting in twos, fives and tens
Repeated addition
Use of arrays
Children should recall multiplication facts for the 2, 5 and 10 times tables through practising counting and understanding of the operation and number patterns. Using doubling and understanding that this is the same as multiplying by 2. Reordering a calculation, knowing that multiplication can be done in any order.


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National Curriculum Objectives:
Multiplication objectives from Multiplication and Division Strand

- Recall and use multiplication and division facts for the 3,4 and 8 times tables.
- Write and calculate multiplication using the multiplication tables they know, including for two-digit numbers times one-digit numbers, suing mental methods and progressing to formal written methods.
- Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and corresponding problems in which $n$ objects are connected to $m$ objects.

| Key Skills/ other linked | Key Vocabulary |
| :---: | :---: |
| NC Objectives (Place |  |
| Value) |  |

All previous vocabulary

- Count from 0 in multiples of 4 and 8 .
Key Skills/ other linked Value)
plus:

Product, multiple


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In year 3, the children will:
Continue to develop their understanding of multiplication through use of practical resources and pictorial representations. Year 2 multiplication must be consolidated for those children who do not have a secure understanding.
Be given the opportunity to practise their recall of the 2,5 and 10 times tables from the start of Year 3, before any new multiplication objectives are introduced.
Start to be introduced to the grid method for multiplication. However, in order to do this, children need secure underst anding of the maths which will underpin this.


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Written Methods for multiplying a two - digit number by a one - digit number. Step 1: Arrays

Firstly, the children will reinforce Year 2 work on arrays, ensuring children have a secure understanding and can apply these to calculate facts for the 3,4 and 8 times tables.


$$
\begin{aligned}
& 4+4+4=12 \\
& 4 \times 3=12
\end{aligned}
$$


$3+3+3+3=12$
$3 \times 4=12$

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Written Methods for multiplying a two－digit number by a one－digit number．

## Step 2：Introducing the Grid Method

| $x$ | 10 | 3 |
| :--- | :--- | :--- |
| 4 | 0000000000 | 000 |
|  | 0000000000 | 000 |
|  | 0000000000 | 000 |
|  | 0000000000 | 000 |

Introduce the grid method to the children by making the arrays to represent the multiplication statement．E．g．＂We need 4 rows of 10 and 4 rows of 3 ＂．
Then move onto using dienes，as a progression towards a more compact method． Children can then represent the work they have done with the practical resources，in a way in which they understand，after modelling by the teacher．


Written Methods for multiplying a two - digit number by a one - digit number. Step 3: The Grid Method

Once the children have a secure understanding of the above steps, the grid method can be introduced, alongside a pictorial representation to start with, then the children practise and use this in a variety of different contexts.


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Written Methods for multiplying a two - digit number by a one - digit number. Step 4: The Grid Method

For those children who show a secure understanding of the previous steps and can use these in a variety of contexts, they may be shown how to record this as a short multiplication method. This should be done alongside the grid method so that children are clear on the link between the two.



## Mental Methods

Counting in $2 \mathrm{~s}, 5 \mathrm{~s}, 10 \mathrm{~s}, 3 \mathrm{~s}, 4 \mathrm{~s}$ and 8 s .
Repeated addition
Recall multiplication facts for 2,5 and 10 times tables (from Year 2)
Recall multiplication facts for 3,4 and 8 times tables
Use known facts and place value to multiply by $2,3,4,5,8$ and 10.
Use doubles to link to $\mathrm{x} 2, \mathrm{x} 4$ and x 8 .
Reorder a calculation, understanding that multiplication can be done in any order.


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## Yedr 4

National Curriculum Objectives:
Multiplication objectives from
Multiplication and Division Strand

- Recall multiplication facts for multiplication tables up to $12 \times 12$.
- Use place value, known and derived number facts to multiply mentally including multiplying by 0 and 1 . Multiply 3 numbers together Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
- Solve problems involving multiplication


## Key Skills/ other linked NC <br> Key Vocabulary Objectives (Place Value)

- Count in multiples of 6 , 7 , and 9

All previous vocabulary, plus:
inverse

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In year 4, the children will:
Be taught specifically, through exploration of place value, to multiply by 10,100 and 1,000 . Children should be confident in discussing the place value of each digit and how these change.
Have the opportunity to apply their known number facts to solve ot
her calculations. E.g. if
$7+4=11$, then $70+40=, 700+400=$ etc.
Be given the opportunity to consolidate and practise their previous learning on multiplication before new content is introduced.
Be practising their recall of their previously learnt times tables ( $2,5,10,3,4$ and 8 ) from the start of year 4, before any new times tables are introduced. Be given regular opportunity to approximate before they calculate and use this to check the accuracy of their calculations

## Written Methods

Step 1: Grid method for multiplying three - digit numbers by a one -digit number.
Recap previous multiplication using the grid method and extend this to multiplying two - digit and three - digit numbers by a one - digit number. Track back for any children who are not confident.


## Written Methods

Step 2: Short multiplication for multiplying by a one - digit number.

Pupils can be asked to work out a calculation using the grid method, and then compare to 'your' column method. What are the similarities and differences? Unpick the steps tooother and chnow how it reduces the steps.



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## Mental Methods

Counting in $6 \mathrm{~s}, 7 \mathrm{~s}, 9 \mathrm{~s}, 25 \mathrm{~s}$ and 100 s
Recall previously learnt multiplication facts with increasing confidence ( $2,5,10,3,4$ and 8 times tables).
Recall multiplication facts for the $6,7,9,11$ and 12 times tables.
Partitioning: multiplying hundreds, tens and ones separately and then recombining. Using understanding of when a number is multiplied by 10,100 or 1,000 .
Using knowledge of number facts and place value e.g. $7 \times 8=56$ to find $70 \times 8,7 \times 80$

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National Curriculum Objectives: Division objectives from Multiplication and Division Strand

- Recall and use division facts for the 2, 5 and 10 times tables.
- Calculate mathematical statements for division within the multiplication tables and write them using the multiplication signs and equals signs. Show that the division of two numbers cannot be done in any order. Solve problems involving division, using materials, arrays, repeated addition, mental methods and multiplication facts, including problems in context.

Key Skills/ other linked NC
Objectives (Place Value) Objectives (Place Value)

Key Vocabulary

- Counting in $2 s, 5 s, 10 s$ and $3 s$.

Year 1 vocabulary plus:
Division, divided by, shared by,

Grouping, sharing, left, left over

In year 2, the children have plenty of opportunities to use objects, arrays and pictorial represent and share.
Develop their understanding of the divide and equals signs through recording their practical activities and exploration.


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## Written Methods:

Step 1: Understanding Arrays and the link between multiplication and division Children should be taught to interpret arrays and use these to understand the link between multiplication and division. For example, by being able to generate the 4 linked multiplication and division sentences.

$$
\begin{array}{rlrl}
\text { Eg } 10 \div 2 & =5 & 2 \times 5=10 \\
10 \div 5 & =2 & 5 \times 2=10
\end{array}
$$



## Written Methods:

Step 2: Practical prohlom colving with a fncile nn rarnonicing ornuning and
sharing.


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Children should be given the opportunity to recap their practical work on sharing and grouping, with a focus on understanding the difference and being taught to recognise whether problems involve grouping or sharing.
Children can use pictures or shapes to divide quantities and start to record the division number sentence alongside these.

Sam has 20 sweets, which she shares equally
between 5 friends. How many will each friend
get?


Children to experience grouping in various different contexts, to ensure they are confident with the concept before looking at grouping using a number line.


## Written Methods:

Step 2: Subtracting groups of a number, using a Number line

Children use a number line, by jumping back equal amount to find out for example, how many g can I buy with $£ 20$ ?


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## Mental Methods

- Counting in $2 \mathrm{~s}, 5 \mathrm{~s}, 10 \mathrm{~s}$ and 3 s
- Links to arrays
- Recalling the division facts for the 2,5 and 10 times tables
- Using knowledge that halving is in the inverse of doubling and the same as dividing by 2.
- Use known facts and place value to divide.



## (DTVITSTOW

Year 3

National Curriculum Objectives: Division<br>objectives from Multiplication and<br>Division Strand<br>\section*{Key Skills/ other linked NC Objectives (Place Value)}

- Recall the division facts for the 3,4 and 8 times tables.
- Write and calculate division statements using the multiplication tables they know.
- Solve problems, including missing number problems, involving division.
- Count in multiples of 4, 8,50 and 100.

Previous vocabulary, plus:

Inverse, short division, carry, remainder, multiple

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In year 3, the children are given the opportunity to explore division in a range of real - life contex


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## Written Methods:

Step 1: Developing understanding of grouping, using a number line and introducing remainders
Children explore, through the continued use of practical equipment, pictures and number lines, th


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Written Methods:
Step 2: Introducing short division (no remainders and no numbers carried)

Once children are secure with division as grouping and sharing, using number lines, arrays etc. sh


## Written Methods:

Step 2: Introducing short division (no remainders and no numbers carried)
Once children have shown a secure understanding of the above 2 steps, they should be taught ho


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## Mental Methods

- Counting in $2 \mathrm{~s}, 5 \mathrm{~s}, 10 \mathrm{~s}, 3 \mathrm{~s}, 4 \mathrm{~s}$ and 8 s
- Recalling the division facts for the 2,5 and 10 times tables - from Year 2
- Recalling the division facts for the 3,4 and 8 times tables.
- Use known facts and place value to divide be $2,3,4,5,8$ or 10
- Using knowledge that halving is in the inverse of doubling
- and the same as dividing by 2 .
- Use this to link to $\div 2, \div 4 \& \div 8$.
- Using known facts/partition in different ways to become more efficient in mental
- calculations: e.g. $39 \div 3$ by taking 3 lots of 10 away mentally, then 3 lots of 3 to get 13 as the answer.
- Use the relationship between multiplication and division.
- Scaling dqwn using known facts.



## DTVISTOM

## Yedr 4

$\begin{array}{cc}\text { National Curriculum Objectives: Division Key Skills/ other linked NC } \\ \text { objectives from Multiplication and } & \text { Objectives (Place Value) }\end{array}$
Key Vocabulary

Division Strand

- Recall division facts for multiplication tables up to 12X12
- Use place value, known and derived facts to divide mentally- including dividing by 1 .
- Recognise and use factor pairs and commutativity in mental calculations.

Previous vocabulary, plus:

Divisible by, factor

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In year 4, the children continue to develop their understanding of division and extend their previc


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## Written Methods:

Dividing numbers with up to 3 - digits by a one - digit number.
Children move into dividing numbers with up to 3 digits by a one - digit number in a wide range o acknowledge this, then carry to number over to the next digit as a remainder.


Year 2 Practising Number and Calculation Skills at Home

Autumn Term


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## Year 3 Practising Number and Calculation Skills at Home

Autumn Term


- Building Fluency -

Spring Term



## Lindow

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Year 4 Practising Number and Calculation Skills at Home

Autumn Term


- Building Fluency -


