## Calculation Policy

| Policy Date: | March 2022 | Version: 1.1 |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Policy Review Date: | March 2025 | Headteacher Debra Bailey | Signed | Insert Date 29/03/2022 |
| Ratified by Governing Body: |  |  |  |  |
| Sue Welford (Chair of Governors) |  | Insert Signature | Insert Date 29/03/2022 |  |

## Early Years

## One-to-one correspondence:

Children first learn to count using one to one correspondence.

Children will be encouraged to say a number each time they touch an object.


## Recognising numerals:



Children learn to recognise numerals to 20.

They are beginning to match the numeral with the correct corresponding quantity.

## Using physical resources:



Children begin by practically taking away one or adding one more. They will also be able to use drawings to support them.

## Numicon:



Children will be able to use Numicon to count, as well ordering them from smallest to biggest to create their own number line. Children should be able to see which Numicon shape is one more or one less.

## Early Years

Number bonds using Tens frame:


The tens frame shows $6+4=10$

Number bonds using Numicon:


Number lines:


Children will be able to use a number line to count, as well as using it to take away or add one. This will be for numbers up to 20.

Part-part-whole model:


Children will use the part-part-whole diagram to add and subtract numbers.

Part-part-whole model:


Alongside the part-partwhole diagram, children will use Numicon and practical resources to add and subtract numbers.

Children will be confident to say and write calculations using the + and - signs.

## Year 1

## Place Value- Counting

Counting to 10 :
We can count on....


Counting with objects:


Counting with objects:

| 1 |  |  |  |  |  |  |  |  |  | 12 | 2 | 3 | 4 | 5 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 |  |  |  |  |  |  |  |  | 1 | 2 | 3 | 4 | 5 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 3 |  |  |  |  |  |  |  |  |  | 3 | 4 | 5 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 3 |  |  |  |  |  |  |  |  |  | 3 | 4 | 5 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 3 | 4 | 5 |  |  |  |  |  | 1 | 2 | 3 | 4 | 5 |  |  |  |  | 910 |

Counting with number lines:


Using multilink cubes


## Year 1

## Place Value

## Dienes to represent numbers:

# Number bond method: 

| Tens | Ones |
| :---: | :--- | :---: |
|  | The dienes show <br> 6 tens and 4 ones. |
| This shows the <br> number 64. |  |


Separating the numbers apart like this is called partitioning.

Writing numbers to 10 :


1
one

Ordering numbers:


5


We can find 1 more and 1 less than.

## Comparing numbers:

There are 3 cupcakes.
There are 5 cookies. $\quad \because \Leftrightarrow \Leftrightarrow \theta$
There are 7 doughnuts. $x \rightarrow x=8$

## Which number is more than the others? Which number is less than the others?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

7 is more than 5.
7 is more than 3.
7 is the greatest.

3 is less than 7.
3 is less than 5.
3 is the smallest.

## Year 1

## Addition

Tens frame:


Number bond method:


Base 10 method:

|  |
| :---: |
|  |  |
|  |  |
|  |  |

Number line method:


## Tens strip:



Count on from the biggest number:

$$
6+4=10
$$

Number bond method:

$$
6+4=10
$$

Picture method:


Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $2+5=7$ | $7-5=2$ |
| $5+2=7$ | $7-2=5$ |

Bar model:


## Year 1

## Subtraction

Tens frame:


Number bond method:


Picture method:


## Tens strip:



Count back from the biggest number:

$$
7-2=5
$$

Number bond method:


Number line method:


Counters method:


Base 10 method:


## Year 1

## Multiplication and Division

Making equal groups


Adding equal groups


There ane 4 trays.
4 trays of $5=20$
4 groups of $5=20$
4 fives $=20$
There are 20 altogether.

Making equal rows


There are 10 toy soldiers in one row 2 tens $=20$
There are 20 toy soldiers altogether:

Making doubles

10,20


## Grouping equally

There are 8 cans.


There are 4 boxes of 2 cans.

## Sharing equally

There are 6 cookies and 3 children.
Each child takes one cookie.

Each child takes one more cookie.

(3) 5

Each child gets 2 cookies.

## Year 2

## Place Value

Counting in tens to 100：
We can count on．．．．


We can represent two－digit numbers in these ways：

| tena | enes |
| :---: | :---: |
| 6 | 5 |



Comparing numbers：


Using the s＞signs

63． 69
maker $\xrightarrow{68} \quad 75$

Counting in tens and ones：


We can make numbers using different number bonds：


We can extend number patterns：


[^0]

We can find the missing numbers in patterns：

##  <br> 




## 

等等是

## Year 2

## Addition

Counters method:


Number bond method:


Number line method:

| 19 | 29 | 30 | 31 | 32 |
| :--- | :--- | :--- | :--- | :--- | :--- |



Column addition:

| Without renaming | With renaming: | Expanded methodi |
| ---: | ---: | ---: |
| 18 | 19 | 19 |
| +41 | +13 | $\frac{+13}{12}$ |
| 29 | 32 | $\frac{20}{32}$ |

Base 10 method:


Number bond method:


Bar model:


Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $19+13=32$ | $32-13=19$ |
| $13+19=32$ | $32-19=13$ |

## Year 2

## Subtraction

Counters method:


Bar model:


Number bond method:


Column subtraction:

Without renaming:

$$
\begin{array}{r}
28 \\
{ }^{1} 28 \\
-\quad 3 \\
\hline 25
\end{array} \begin{array}{r}
29 \\
-19 \\
\hline
\end{array} \begin{array}{r}
\frac{-14}{5} \\
\frac{10}{15}
\end{array}
$$

Base 10 method:


Number line method:


Number bond method:


Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $25+3=28$ | $28-3=25$ |
| $3+25=28$ | $28-25=3$ |

## Year 2

## Multiplication

Repeated addition:


Number line method:


Groups of:


Grouping Method:
Abstract calculations:

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

## Year 2

## Division

## Make a family of

 multiplication and division facts:Losk at the picture.
Make a family of multiplication and divition facts.

$2 \times 10=20-20 \div 2=10$
$10 \times 2=20-20 \div 10=2$

## Solving Problems:

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag How many bags does Ruby need?

Method 2 Draw a picture.


## Solving Problems

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag. How many bags does Ruby need?

## Method 1



## Solving Problems:

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag How many bags does Ruby need?

Method 3 Use a division equation.
$15 \div 5=3$

Ruby needs $\mathbf{3}$ bags.

## Year 3

## Place Value

Base ten or dienes blocks:


## Value of digits:

| hundreds | tens | ones |
| :---: | :---: | :---: |
| 4 | 2 | 7 |

$427=4$ hundreds +2 tens +7 ones
$427=400+20+7$

The digit 4 stends for 4 hundreds or 400 .
The digit 2 stands for 2 tens or 20.
The digit 7 stands for 7 ones or 7 .

We write 427 as four hundred and twerty-seven.
Number lines:


Finding 1 more or less than:


Number bond method:


Place value cards:


Separating the numbers apart like this is called partitioning.

Finding 10 more or less than:


Finding 100 more or less:

$\downarrow 200$ more


## Year 3

## Addition

Counters method:


Number line method:

| 213 | 214 | 215 | 216 | 217 |
| :--- | :--- | :--- | :--- | :--- |



Number bond method:


Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $213+4=217$ | $217-4=213$ |
| $4+213=217$ | $217-213=4$ |

Base 10 method:


Bar model:

| 217 |  |
| :---: | :---: |
| 213 | 4 |

How many penols do they have altogether?
25
$15+23=38$
They howe 38 pencils altogether
Number bond method:


Column addition:
Without renaming:
With renaming:

| 213 |
| ---: |
| $+\quad 413$ |
| 217 |$+4979$

## Year 3

## Subtraction

Counters method:

| Hundreds | Tens | Ones |
| :---: | :---: | :---: |
|  |  | (1) <br> 1 <br> (1) <br> 1 |

Number line method:


Number bond method:


Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $658-4=654$ | $654+4=658$ |
| $658-654=4$ | $4+654=658$ |

Base 10 method:


Bar models:


Number bond method:


Column subtraction:
Without renaming:


## Year 3

## Multiplication

Arrays：

| 3 times tables | 4 times tables | 8 times tables |
| :---: | :---: | :---: |
|  |  |  |
| $3 \times 5=15$ | $4 \times 5=20$ | $8 \times 5=40$ |
| （doubling the 4 times tabies） |  |  |

Number bond strategy：


Bridged column method：
With renaming

Multiply the ones by 4 ．


5 anes $=4-20 \mathrm{cnas}$
20 ones $=2$ tens

Multiply the tens by 4 ．


2 tens $\times 4=8$ tens

Add the products

$20+80=100$

Short multiplication：
With renaming

Multiply the ones by 4.


7 ones $\times 4=28$ ones 28 ones $=2$ tens +8 ones

Multiply the tens by 4


4 tens $\times 4=16$ tens 16 tens +2 tens $=18$ tens

Make a family of multiplication and division facts：
素業㸁業業
絭絭幽䍧粪粪
$6=4=24-24+6=4$
$4=16=24-24+4=6$

Bridged column method： Without renaming
$13 \times 3=$ 39


3


Short multiplication：
Without renaming
$2 \times 4=8$

$\square$

$2 \times 40=80$


Solving word problems： Bar model


## Year 3

## Division

Grouping: 'groups of'
Put $8 \bullet$ into groups of 4 .

$8 \div 4=2$
2 plates are needed.
Thave mode groups of 4
There are 2 equal groups,
There are 4 in each group.
2 equal groups of 4 equads 8 .

Grouping: 'equal groups'
Put 8 into 4 equal groups.

$8 \div 2=4$
4 trays are needed.

Number bond strategy: Division


Solving word problems:


Make a family of multiplication and division facts:

$6 \times 4=24-24+6=4$
$4 \times 6=24-24+4=6$

Number bond and long division:


## (3)

4




8 tens $+8-1$ ten

## Year 4

## Place Value

## Base ten or dienes blocks: Partitioning:

Thousands/Hundreds/Tens/Ones
$2345=2000+300+40+5$
2345 is a 4 -digit

2 thousands +3 hundreds +4 tens +5 ones

## Value of digits:

2 thousands +3 hundreds $* 4$ tens +5 ones

| thousands | hundreds | tens | ones |
| :---: | :---: | :---: | :---: |
| 2 | 3 | 4 | 5 |

$2345=2$ thousands +3 hundreds +4 tens +5 ones $2427=2000+300+40+5$
The digit 2 stands for 2 thousand or 2000.
The digit 3 stands for 3 hundreds or 300 .
The digit 4 stands for 4 tens or 40 .
The digit 5 stands for 5 ones or 5 .

We write 2345 as two thousand, three hundred and forty-five.


We write 2345 as two thousand, three hundred and forty-flive.

## Place value cards:



Separating the numbers like this is called partitioning.

Comparing numbers:
number.


Number patterns:

What number

| 14 |
| :--- | :--- | :--- |

ก
This dpt changes because
we mbtroct 160
$1485-100=1395$

This opt Changes because
we add 1 .
$1485+1=1486$
What number 1520 morethon 14857
1485
The daH Charges because we ods 10
$1485+10=1495$
-

Place value counters:


352 is more than 241
352 is greater than 241

Comparing numbers:


$$
352>241
$$



2500 is less than 5800 $2500<5800$

## Year 4

## Addition

Base 10 method:

| Thousands | Hundreds | Tens | Ones |
| :---: | :---: | :---: | :---: |
|  |  | ㅍำ 표 |  |

Vumber line method:


Number bond method:


Bar model:


Counters method:

| nomamas |  | Tems | ome |
| :---: | :---: | :---: | :---: |
| - | $\Theta \odot$ |  | ${ }^{-1}{ }^{-8}$ |
|  |  |  | $+$ |

Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $1415+12=1427$ | $1427-12=1415$ |
| $12+1415=1427$ | $1427-1415=12$ |

Number bond method:


Column addition:


## Year 4

## Subtraction

Counters method:

|  | matan | rom | ome |
| :---: | :---: | :---: | :---: |
| - | $\stackrel{\ominus}{\odot} \cdot \bigcirc \bigcirc$ | (1) (3) | - |

Number line method:


Number bond method:


Bar model:


Base 10 method:


Abstract calculations:

| Commutative | Inverse |
| :---: | :---: |
| $1728-4=1724$ | $1724+4=1728$ |
| $1728-1724=4$ | $4+1724=1728$ |

Number bond method:


> Without renaming
> With renaming:
> $1^{6} 7^{11} \neq 8$
> $\begin{array}{r}-\quad 4 \\ -1724 \\ \hline 379\end{array}$

## Year 4

## Multiplication

Bar model:


Multiply 3 numbers:


Multiplying by 10:


Bridged and short multiplication:


Number line method:


Array method:

$6 \times 3=18 \quad$ OR $\quad 3 \times 6=18$

Multiplying by 100:


Bridged and short multiplication:


## Year 4

## Division

Division by grouping:

$36 \div 9=4$
Each group has 4 strawberries.

Plocing in groups of 9

$36 \div 9=4$
There are 4 groups.

Grouping with remainders:

There were 11 balloons.


The quotient is 5 and the remainder is 1 .
Each friend got 5 balloons.
There was 1 balloon left over:

Divide using multiplication:

$$
\begin{aligned}
& 24 \div 3=\underline{8} \\
& 3 \times \underline{8}=24
\end{aligned}
$$

Divide with remainders:


Divide without remainders:

## Method 1



## Year 5 and 6

## Addition

Add numbers with more than 4 digits

$104,328+61,731=166,059$

| $H T h$ | $T h$ | $T h$ | $H$ | $T$ | 0 |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  |  | 0 |  |  |  |
|  |  |  |  |  |  |
|  | 00 |  | 000 | 00 | 0 |
|  |  |  | 0 |  |  |


| 1 | 0 | 4 | 3 | 2 | 8 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| + | 6 | 1 | 7 | 3 | 1 |
| 1 | 6 | 6 | 0 | 5 | 9 |
| 1 |  |  |  |  |  |

## Year 5 and 6

## Addition

Add with up to 3 decimal places


| Ones | Tenths | Hundredths |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |



## Year 5 and 6

## Subtraction

Subtract numbers with more than 4 digits


## $294,382-182,501=111,881$



## Year 5 and 6

## Subtraction

Subtract with up to 3 decimal places


| Ones | Tenths | Hundredths |
| :---: | :---: | :---: |
|  |  |  |



## Year 5 and 6

## Multiplication

Multiply 4-digit numbers by 1-digit numbers


|  | Th | H | T | O |
| :---: | :---: | :---: | :---: | :---: |
|  | 1 | 8 | 2 | 6 |
| $\times$ |  |  |  | 3 |
|  | 5 | 4 | 7 | 8 |
|  | 2 | 1 |  |  |
| 1 |  |  |  |  |

## Year 5 and 6

## Multiplication

Multiply 2-digit numbers by 2-digit numbers


## Year 5 and 6

## Multiplication

Multiply 3-digit numbers by 2-digit numbers


| Th | H | T | O |
| :---: | :---: | :---: | :---: |
|  | 2 | 3 | 4 |
| $\times$ |  | 3 | 2 |
|  | 4 | 6 | 8 |
| 7 | 10 | 2 | 0 |
| 7 | 4 | 8 | 8 |

## $234 \times 32=7,488$

| $\times$ | 200 | 30 | 4 |
| :---: | :---: | :---: | :---: |
| 30 | 6,000 | 900 | 120 |
| 2 | 400 | 60 | 8 |

## Year 5 and 6

## Multiplication

Multiply 4-digit numbers by 2-digit numbers

| TTh | Th | H | T | O |
| :--- | :--- | :--- | :--- | :--- |
|  | 2 | 7 | 3 | 9 |
| $\times$ |  |  | 2 | 8 |
| 2 | 1 | 9 | 1 | 2 |
| 2 | 4 | 7 | 8 | 0 |
| 1 | 6 | 6 | 9 | 2 |
| 7 | 6 | 7 | 7 |  |

$2,739 \times 28=76,692$

## Year 5 and 6

## Division

Divide 3-digit numbers by 1-digit numbers (grouping)


|  |  | 2 | 1 | 4 |
| :--- | :--- | :--- | :--- | :--- |
|  | 4 | 8 | 5 | ${ }^{1} 6$ |

$$
856 \div 4=214
$$



## Year 5 and 6

## Division

Divide 4-digit numbers by 1-digit numbers (grouping)


|  | 4 | 2 | 6 | 6 |
| :---: | :---: | :---: | :---: | :---: |
| 2 | 8 | 5 | $1_{3}$ | $1_{2}$ |

$8,532 \div 2=4,266$

## Year 5 and 6

## Division

Divide multi-digit numbers by 2-digit numbers (short division)

|  |  | 0 | 3 | 6 |
| :--- | :--- | :--- | :--- | :--- |
|  | 12 | 4 | $4_{3}$ | $7_{2}$ |

$$
432 \div 12=36
$$

$$
7,335 \div 15=489
$$

|  | 0 | 4 | 8 | 9 |
| :---: | :---: | :---: | :---: | :---: |
| 15 | 7 | ${ }^{7} 3$ | $13_{3}$ | $1_{5}$ |


| 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

## Year 5 and 6

## Division

Divide multi-digit numbers by 2-digit numbers (long division)

|  |  | 0 | 3 | 6 | ( $\times 30$ | $\begin{aligned} & 12 \times 1=12 \\ & 12 \times 2=24 \\ & 12 \times 3=36 \\ & 12 \times 4=48 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 4 | 3 | 2 |  |  |
|  | - | 3 | 6 | 0 | ( $\times 6$ ) |  |
|  |  |  | 7 | 2 |  | $12 \times 6=72$ |
|  | - |  | 7 | 2 |  | $12 \times 7=84$ |
|  |  |  |  | 0 |  | $12 \times 7=108$ |

$$
7,335 \div 15=489
$$

$$
432 \div 12=36
$$

|  | 0 | 4 | 8 | 9 | ( $\times 40 \mathrm{C}$ | $1 \times 15=15$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 15 | 7 | 3 | 3 | 5 |  |  |
| - | 6 | 0 | 0 | 0 |  | $2 \times 15=30$ |
|  | 1 | 3 | 3 | 5 |  | $3 \times 15=45$ |
| - | 1 | 2 | 0 | 0 | ( $\times 80$ ) | $4 \times 15=60$ |
|  |  | 1 | 3 | 5 |  | $5 \times 15=75$ |
| - |  | 1 | 3 | 5 | ( $\times 9$ ) | $10 \times 15=150$ |
|  |  |  |  | 0 |  |  |

## Year 5 and 6

## Division

Divide multi-digit numbers by 2-digit numbers (long division)
$372 \div 15=24 \mathrm{r} 12$

|  |  |  | 2 | 4 | $r$ | 1 | 2 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 5 | 3 | 7 | 2 |  |  |  |
|  | - | 3 | 0 | 0 |  |  |  |
|  |  |  | 7 | 2 |  |  |  |
|  | - |  | 6 | 0 |  |  |  |
|  |  |  | 1 | 2 |  |  |  |

$$
\begin{aligned}
& 1 \times 15=15 \\
& 2 \times 15=30 \\
& 3 \times 15=45 \\
& 4 \times 15=60 \\
& 5 \times 15=75 \\
& 10 \times 15=150
\end{aligned}
$$

|  |  |  | 2 | 4 |
| :--- | :--- | :--- | :--- | :--- |
| 1 | 5 | 3 | 7 | 2 |
|  | - | 3 | 0 | 0 |
|  |  |  | 7 | 2 |
|  | - |  | 6 | 0 |
|  |  |  | 1 | 2 |

$$
372 \div 15=24 \frac{4}{5}
$$


[^0]:    

