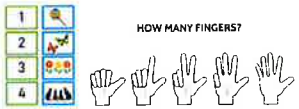
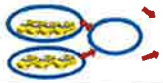
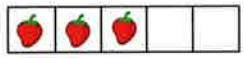
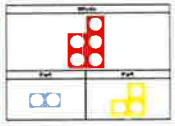
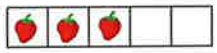
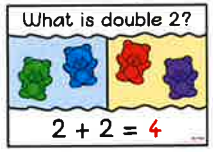
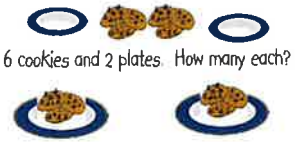
N	ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION
NWLJDS CALCULATIONS POLICY (MAY 2023)	In Nursery, children engage in a wide variety of practical activities using real objects, songs, rhymes, games and stories to explore number and addition. The children develop a quick recognition up to 3 objects using 'Subitising', count up to and beyond 5, say numbers in order up to 5, link numerals to a number of objects up to the number 5. Children begin finding the corresponding numeral for 1-3 objects, then 1-5, then 1-10 and beyond.  Children learn that the last number they count tells them the total number. Board games, real world problems and topics looked at each week are used to make comparisons between quantities. Children develop language such as 'more than  Children are encouraged to respond to and use addition vocabulary in rhymes and songs. Children are introduced to parts and wholes and are taught to find the total number of objects in two groups by counting them all. 	In Nursery, children engage in a wide variety of practical activities using real objects, songs, rhymes, games and stories to explore subtraction. Board games, real world situations and topics looked at each week are used to make comparisons between quantities. They make comparisons between quantities and develop language such as 'fewer than'.  Children learn that a group of objects changes amount when something is taken away and children count find the total items after some are taken away by counting all of them. Children are encouraged to respond to and use subtraction vocabulary in rhymes, songs and stories. e.g. ten green bottles, five little monkeys	In Nursery, children discuss and identify patterns around them. There is a focus on an ABAB pattern using counters, shapes and games.  Children learn to identify the pattern, extend it and notice and correct errors in a repeating pattern.	Children will engage in a variety of number rhymes, games and activities. Opportunities are created for children to separate objects into unequal groups as well as equal groups. eg: 4 apples. Can you share them between two people?  Children will note 'There are none left' when sharing things out.

R	ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION
NWLJDS CALCULATIONS POLICY (MAY 2023)	In Reception, key skills including subitising, counting, composition, sorting and matching and comparing and ordering are taught. By the end of Reception, children are expected to know their number bonds to 10. Real objects, number tracks, counters, number frames, Numicon, stories, rhymes and songs are used to develop understanding of number and addition. Children explore the different compositions of numbers up to 10, focusing on 3 first, then 4 and 5, then 6, 7 and 8, then finally 9 and 10. E.g. 3 can be composed of 2 and 1. Objects, ten frames and numicon are used to explore number bonds to 10. Five frames, objects, fingers and counters are used to find one more than a given number and the link between counting forwards and one more is made explicit. Ask children to make a number on a five frame.  Can you show me one more? One less? Children are introduced to parts and whole to combine 2 amounts together using part-whole models. Using objects and Maths stories, children learn how to add more by finding the number of objects they have at first and then counting on to find the total.  	In Reception, children will engage in a variety of counting songs and rhymes and practical activities related to subtraction. Five and ten frames, number tracks objects and counters are used to find one less than a given number and the link between counting backwards and one less is made explicit. Ask children to make a number on a five frame.  Can you show me one more? One less? Real objects and Maths stories are used to show children that the quantity of a group can be changed by taking items away.  First there were 5 people on the bus. Then 2 people got off the bus. Now there are 3 people on the bus.  After counting out objects, children are encouraged to physically remove these by counting and dragging them away. They then count how many are left. 	In Reception, children will engage in a wide variety of songs, rhymes, games and activities related to multiplication. In practical activities and through discussion they will begin to solve problems involving doubling. Children are given opportunities to build doubles using real objects and they begin to relate doubles as repeated addition.  eg: 'Three apples for you and thee apples for me. How many apples altogether?'   Children learn the concept of equal groups and can recognise when groups are equal or not equal.	In Reception, children will engage in a wide variety of stories, songs, rhymes, games and activities. In practical activities and through discussion they will begin to solve problems involving halving and sharing. Children learn to recognise what equal groups are and practise sharing items out equally and problem solve with grouping and sharing.  Eg. Can you arrange the sweets into groups of 2? How about groups of 3? Can you give me half your sweets? Children are taught to identify even and odd numbers by being shown that some quantities will share equally into 2 groups and some wont.

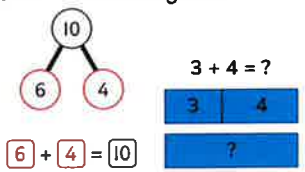
NWLJDS CALCULATIONS POLICY (MAY 2023)

Y1

ADDITION

In Year 1, children are expected to know their number bonds to and within 20 and add 1- and 2-digit numbers to 20. Children start with addition within 10 before moving on to addition within 20.

Children are introduced to parts and wholes and use part-whole models to combine and split a group of objects or numbers in different ways. Bar models are also used to add numbers together.

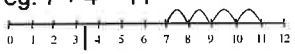


This leads children to write additions in a number sentence using the symbols (+) and (=).

Children should be able to add one to any number using a number line or set of objects.

The children also use number lines, fingers, cubes and other concrete objects to count on in ones.

eg: 7 + 4 = 11



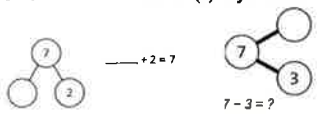
Children also learn to recognise fact families and understand that the order of an addition sentence can be varied.
e.g. 2 + 5 = 7, 5 + 2 = 7, 7 = 2 + 5, 7 = 5 + 2

Using manipulatives and realistic situations, children solve addition problems.

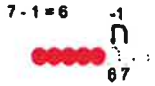
SUBTRACTION

In Year 1, children are expected to know their number bonds and related subtraction facts within 20, how to subtract one-digit and two-digit numbers within 20.

The children first use their number bonds to find a part of the whole. Part-whole models are used to support this and the introduction of the subtraction (-) symbol.



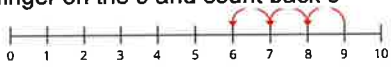
Children should be able to subtract one from any number using a number line or set of objects.



Children should be shown pictures of counters/objects and cross out the number of objects being 'taken away'.

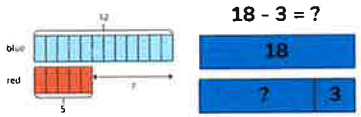
7 - 6 = ____

Number lines are also used to support subtraction by counting back. eg: 'Put your finger on the 9 and count back 3'



9 - 3 = ____

Children also learn about finding the difference by counting back or counting on and bar models are used to visualise finding the unknown.



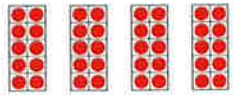
Children then use their knowledge of subtraction and number bonds to solve missing number problems by finding the inverse.
eg: 3 + ____ = 8

MULTIPLICATION

In Year 1, children learn how to count in 2s, 10s and 5s.

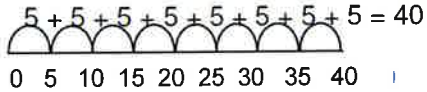
Children start by counting in 2s, using objects that come in pairs, as well as number squares, number lines and fingers.

Children then move on to counting in 10s using similar methods, such as ten frames, focusing on multiples up to 50.



They then learn to count in 5s in the same way.

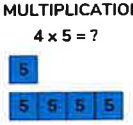
How many pencils altogether?



Children are introduced to equal groupings and repeated addition is used to add these equal groupings together.

Objects and counters are used to make doubles up to 20.

Bar models are also used to visualise multiplication.

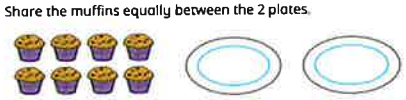


DIVISION

In Year 1, children begin to explore division through grouping.

They will share objects into equal groups in a variety of situations. They begin to use the vocabulary associated with division in practical contexts.

How many muffins will each plate have?



Children should see that each group will have an equal amount. Children are also explicitly taught what is and isn't an equal group.

Bar models are also used to visualise division calculations.

NWLJDS CALCULATIONS POLICY (MAY 2023)

Y2

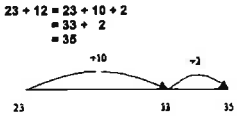
ADDITION

In Year 2, children are taught to add a 2 digit number and ones; a 2-digit number and tens, three one-digit numbers and two 2-digit numbers.

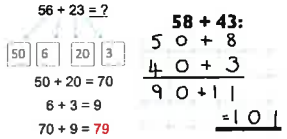
Children are expected to know their number bonds to 10, 20 and 30 and use related facts to find number bonds within 100.
e.g. 2 + 5 = 7, so 20 + 50 = 70

Diene's blocks, number lines, bar models, hundred grids and counters are used to support adding numbers up to 100.

Children develop confidence adding 1s and 10s to given numbers and adding across the 10s boundary by counting on in tens and ones.



The partitioning method is used to add two 2-digit numbers with and without exchange. Numbers are partitioned into 10s and 1s before adding them. Calculations are set out horizontally then vertically to prepare them for column method.



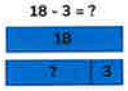
The column method may be introduced later in the year adding the ones first then the tens and carrying any 1s on the doorstep.

SUBTRACTION

In Year 2, children are taught to subtract a 2-digit number and ones; a 2-digit number and tens and two 2-digit numbers.

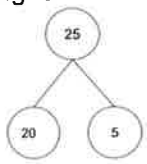
Number lines, bar models, hundred grids, Diene's blocks and counters are used to support subtracting numbers within 100.

Children develop confidence subtracting 1s and 10s to given numbers and subtracting across the 10s boundary by counting backwards in tens and ones.



The partitioning method is used to subtract two 2-digit numbers with and without exchange. The number being subtracted is partitioned into tens and ones before subtracting the tens and then the ones.

e.g. 54 – 25



54 – 20 = 34
34 – 5 = 29

The column method may be introduced later in the year, subtracting the ones first then the tens.

MULTIPLICATION

By the end of Year 2, children are expected to know their 2, 5 and 10 times

Counters, arrays and pictures are used to model multiplication to show how to group numbers/objects.

Children should be able to model a multiplication calculation using an array.

eg: '5 groups of 2 faces. How many faces altogether?
'2 groups of 5 faces'. How many faces altogether?

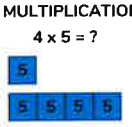
Children should know that 2 x 5 has the same answer as 5 x 2.

Children will develop their understanding of multiplication and use jottings to support their calculations.

Repeated addition is also used to count in steps of 3.

e.g. 3 lots of 5 is equal to 5 + 5 + 5 = 15

Bar models are also used to visualise multiplication.



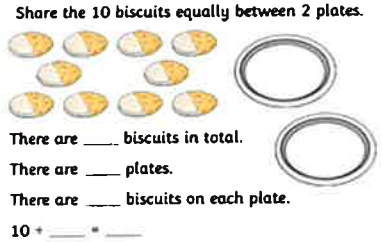
DIVISION

In Year 2, children should also know the inverse of the 2, 5 and 10 times tables. Children are shown how to use jottings to share in equal groups.

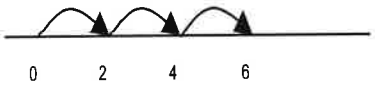
Arrays, number lines and counters are used to represent division calculations.

Children use sharing and grouping to show division.

Sharing
6 sweets are shared between 2 people. How many do they have each?



Grouping – There are 6 sweets. How many people can have 2 each? Children count in steps. (How many 2's make 6?)



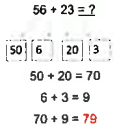
Y3

NWLJDS CALCULATIONS POLICY (MAY 2023)

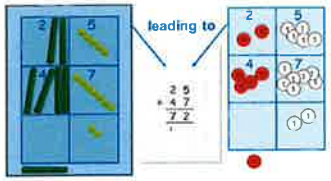
ADDITION

In Year 3, children should be able to use mental methods to add 1, 10 or 100 from given numbers.

Children continue to use the partitioning method of addition, particularly for mental addition.

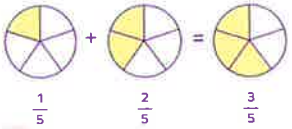


Children are then taught the formal written method of column addition to add numbers up to 3 digits without and with exchange. When exchanging, children are taught to add the ones first and 'carry' numbers underneath the calculation. Concrete and pictorial resources, including Diene's blocks, counters and place value grids are used to support this method.



Children should be able to add two numbers with a different number of digits.

Children build on their understanding of numerators and denominators to add 2 fractions within 1 whole.



SUBTRACTION

In Year 3, children should be able to use mental methods to subtract 1, 10 or 100 from given numbers.

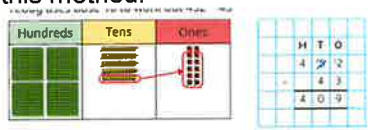
Children continue to use the partitioning method of subtraction, particularly for mental subtraction.
e.g. 54 – 25

54 – 20 = 34
34 – 5 = 29

Children are then taught the formal written method of column subtraction to subtract numbers up to 3 digits. They first learn to subtract numbers without exchange and then are taught to exchange/regroup from one or more columns.
eg:

$$\begin{array}{r} {}^{8}\not{9}^{1}48 \\ -263 \\ \hline 685 \end{array}$$

Children should be able to subtract a 2 digit number from a 3 digit number. Concrete and pictorial resources, including Diene's blocks, counters and place value grids are used to support this method.



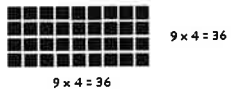
Children build on their understanding of numerators and denominators to subtract 2 fractions within 1.

$\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$

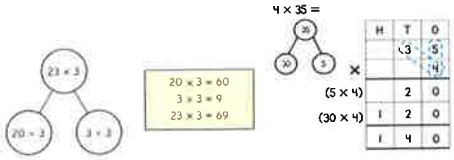
MULTIPLICATION

By the end of Year 3, children are expected to know the 2, 3, 4, 5, 8 and 10 times tables. They use different strategies to learn the 3, 4 and 8 times table and their related division facts.

Arrays, repeated addition, step counting, number squares, games and weekly times tables tests are used to teach children their times tables.



Children learn how to multiply any number by 10 and use this, alongside partitioning to help with the expanded method when multiplying a 2 digit number by a 1 digit number.



Children then move on to the compact short multiplication method to multiply a 2 digit number by a 1 digit number ensuring they carry underneath the calculation.

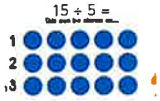
$$\begin{array}{rrr} & 4 & 8 \\ \times & & 6 \\ \hline 2 & 8 & 8 \\ & 4 & \end{array}$$

Children use multiplication to solve problems related to scaling e.g. three times as many.
Bar models are used to support this.

DIVISION

In Year 3, children are expected to know the inverse of the 2, 3, 4, 5, 8 and 10 times tables.

Arrays are used to represent division calculations.



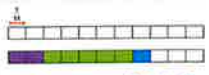
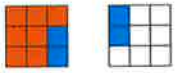
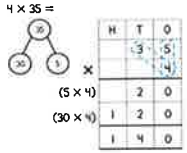
Concrete resources such as counters and objects are used to model division by sharing and grouping. Children use the jottings method to share objects into groups.

Number lines are also used to help children with step counting.

This leads on to the children using the short division method (bus stop method) to divide 2 digit numbers by a 1 digit number. Initially, remainders are not introduced within the calculation.

$$3\overline{)96}\ 32$$

When children are ready, remainders within calculations are introduced and the notation will need to be made explicit as this may be the first time the children encounter remainders.
e.g.
43 ÷ 3 = 14 remainder 1 or 14 r1

Y4	ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION
NWLJDS CALCULATIONS POLICY (MAY 2023)	In Year 4, children should be able to add numbers up to 5 digits using the formal written method (column addition), adding the ones first and 'carrying' numbers underneath the calculation. Place value grids are used to support laying out the calculations correctly. **e.g. 3517 + 396 = 3916** + 3517 396 3913 1 1 This is extended to decimals with the same number of decimal places in the context of money towards the end of the year, carefully aligning place value columns and decimal points. 18·42 + 5·37 23·79 1 Children learn that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts. eg: £3.59 + 78p Using diagrams, children learn how to add 2 or more fractions with like denominators, understanding that you add the numerators, not the denominators.  $\frac{2}{11} + \frac{5}{11} + \frac{1}{11} = \frac{2+5+1}{11}$	In Year 4, children should be able to subtract up to 5 digits using the formal written method (column subtraction/ decomposition method) with regrouping/exchanging. Place value grids are used to support laying out the calculations correctly. It is explained through place value that you exchange 1 ten for 10 ones. eg: 2 11 17 - 4 9 2 7 8 This is extended to decimals with the same number of decimal places in the context of money and measurement. Using this method, children should be able to find the difference between two three-digit sums of money, carefully aligning place value columns and decimal points. eg: £ 6 17 . 14 10 - £ 2 . 9 9 £ 4 . 5 1 Using diagrams, children learn how to subtract fractions with like denominators, understanding that you subtract the numerators, not the denominators. $\frac{11}{9} - \frac{4}{9} = \frac{7}{9}$ 	By the end of Year 4, children will know all the times tables up to 12 x 12. Children use a mixture of strategies, including arrays, repeated addition, counting and the times tables they already know to learn the remaining times tables. They also learn to multiply given numbers by 10, 100 and 1000, including decimals. Children should continue to multiply 2-digit numbers by a 1 digit number using the expanded method.  Once secure on the expanded method, children should then be taught to use the compact short multiplication method. This involves multiplying 2- or 3- digit numbers by a single digit number using all the multiplication tables up to 12 x 12 with and without exchange. 48 × 6 = 288 4 327 × 4 = 1308 1 2	In Year 4, children should learn all related division facts for their times tables up to 12 x 12. They then learn to divide 2 and 3 digit numbers by a single digit using the short division / bus stop method. They also learn to divide given numbers by 10, 100 and 1000, including decimals. Pupils must be secure with the process of short division for dividing 2 digit numbers by a single digit. 18 4 ⟌ 3 72 Pupils then move onto dividing numbers with up to 3 digits by a single digit. 362 ÷ 7 = 51 r5 7 ⟌ 362 1 Any remainders should be shown as integers ie: 51 remainder 5 or 51 r 5. This will be applied to real life contexts, including money and measure, but problems will not result in a remainder at this stage.

Y5

NWLJDS CALCULATIONS POLICY (MAY 2023)

ADDITION

In Year 5, children learn to add numbers with up to 6 digits (up to one million) using the formal written method (column method).

```
  21848
+ 1523
 23371
   1 1
```

This is then extended to include money, measures and decimals up to 3 decimal places.

£23.59 + £7.55

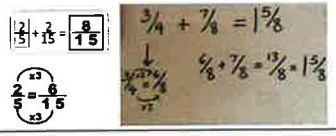
```
  £23.59
+ £ 7.55
 £ 31.14
   1 1 1
```

Children should be able to add more than two values, carefully aligning the place value columns and decimals.

```
  19.01
   3.65
+  0.70
  23.36
   1 1
```

Empty place value columns, such as the hundredths above can be filled with a zero to show the place value line in each column.

Children learn how to add fractions and mixed numbers with unlike denominators that are common multiples of each other, using their knowledge of equivalent fractions.



SUBTRACTION

In Year 5, all children should be able to subtract numbers up to 6 digits (numbers up to one million) with exchanging using the formal written method (column method).

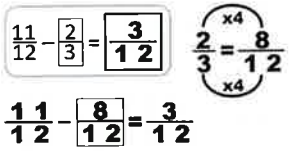
```
  38291
- 18636
  19655
```

This is then extended to include money, measures and decimals up to 3 decimal places, carefully aligning the place value columns and decimals.

```
  37 97 14 8 . 13 10
+  6 7 5 3 . 6 6
  31 2 9 5 . 7 4
```

They will also know that decimal points should line up under each other, particularly when subtracting mixed amounts.

Children learn how to subtract fractions and mixed numbers with unlike denominators that are common multiples of each other, using their knowledge of equivalent fractions.



MULTIPLICATION

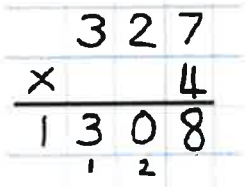
In Year 5, children continue to apply their times tables and place value knowledge to multiply by increasingly large numbers and they should be able to multiply any number by 10, 100 or 1000, including decimals.

2 × 30 = 60

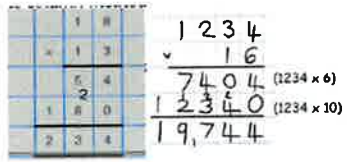
2 × 300 = 600

2 × 3,000 = 6,000

Children multiply up to 4 digit numbers by 1 or 2 digits using the compact column multiplication method.



The children then progress to using the column method for long multiplication up to 4 digit x 2 digit.



Children learn to multiply fractions by integers.

$5 \times \frac{2}{3} = \frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}$

$= \frac{10}{3}$

$= 3\frac{1}{3}$

DIVISION

In Year 5, the children divide up to 4 digits by a single digit, including those with remainders using the bus stop method.

```
      0 6 6 3 r5
    ┌──────────
    │   5 3 2
8   │ 5 3 0 9
```

The answer is then expressed as 663 r5.

Children then use the context of problems with money and measures to decide how to use the remainder, such as rounding the answer.

Children should also be able to divide any number by 10, 100 or 1000, including decimals.

Y6

NWLJDS CALCULATIONS POLICY (MAY 2023)

ADDITION

In Year 6, children should be able to add numbers with any number of digits using the formal written method (column method), including decimals up to 3 decimal places.

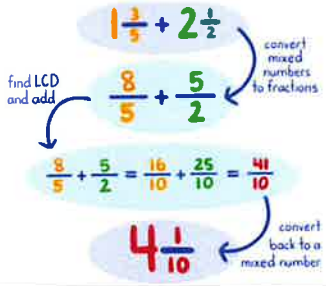
Children should be able to add more than two values, carefully aligning the place value columns and decimals.

eg:

```
  23.361
   9.080
  59.770
+  1.300
  93.511
  2 1 2
```

Children should be able to solve multi step problems using formal methods and explain reasoning behind their calculations.

Children should also be able to add fractions and mixed numbers with unlike denominators by finding common denominators.



SUBTRACTION

All children should be able to subtract numbers with any number of digits, with exchange using the formal written method (column method).

Children use increasingly large and more complex numbers and decimal values to subtract money and measures.

eg:

```
  3 7 9 14 8 . 13 10
-   6 7 5 3 . 6 6
  3 1 2 9 5 . 7 4
```

Children should be expected to use column method to subtract money and measures, including decimals with different numbers of decimal places.

They will also know that decimal points should line up under each other., particularly when subtracting mixed amounts,

eg: 13.72 – 4.1 – 2.964

Children should also be able to subtract fractions and mixed numbers with unlike denominators by finding common denominators.

$5\frac{1}{4} - 2\frac{2}{3}$ $\frac{63}{12} - \frac{32}{12} = \frac{31}{12}$

$\frac{21}{4} - \frac{8}{3}$ $= 2\frac{7}{12}$

MULTIPLICATION

In Year 6, children will continue to practise short multiplication and long multiplication with numbers of increasing size.

When they are secure with multiplication for TO x O and TO x TO, they should have little difficulty in using the same method for HTO x TO and THTO x HTO.

eg:

```
  1 2 3 4
x     1 6
  7 4 0 4   (1234 x 6)
1 2 3 4 0   (1234 x 10)
1 9,7 4 4
```

Using similar methods, children will be able to multiply decimals, using numbers with differing decimals places.

3.4 x 2.86
×10 ×100

```
  2 8 6
x   3 4
  1 1 4 4
  8 5 8 0
  9 7 2 4
```

9724 ÷ 10 ÷ 100
= 9.724

Children are also expected to multiply fractions by multiplying the numerators first and then the denominators.

$\frac{2}{5} \times \frac{6}{7} = \frac{2 \times 6}{5 \times 7} = \frac{12}{35}$

$\frac{1}{4} \times \frac{2}{3} = \frac{1 \times 2}{4 \times 3} = \frac{2}{12} =$ reduces to $\frac{1}{6}$

DIVISION

In Year 6, children will continue to practise short division using the bus stop method. They will also be taught to divide up to 4 digit numbers by 2 digit numbers using long division.

Children are taught to write the multiples of the divisor before completing the calculation.

eg:

```
   0 0 6 1 7
73|4 5 0 4 1
```

```
4'8'0      1'2 4
-4 3 8     - 7 3   ← calculating remainders
  0 1 2      5 1
```

```
 73
146
219
292
365
438
511
584
657
```

Children should interpret remainders as decimals up to 2 decimal places.

Children continue to use the context of problems with money and measures to decide how to use the remainder, such as rounding the answer.

Children are also expected to divide fractions by using the keep, switch, flip method.

e.g. $\frac{3}{5} \div \frac{2}{3} = \frac{3}{5} \times \frac{3}{2} = \frac{9}{10}$

By the end of Year 6 we aim for the children to use mental methods (with jottings) when appropriate; but for calculations they cannot do in their heads, use an efficient formal written method accurately and with confidence. All children should be fluent in the written methods for all four operations.