UTTOXETER PYRAMID: AGREED CALCULATION POLICY

First Schools / Middle Schools (Reception – Y6)

Reviewed: September 2022

EYFS

- Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number.
- Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.
- They solve problems, including doubling, halving and sharing.

Year 1

Addition and subtraction

Pupils should be taught to:

- read, interpret and practise writing mathematical statements involving addition (+), subtraction (-) and equals (=) signs accurately.
- add and subtract 1-digit and 2-digit numbers to 20 (9 + 9, 18 - 9), including zero.
- add three 1-digit numbers.
- recall and use number bonds and related subtraction facts within 20.
- solve simple word problems that involve addition and subtraction.

Multiplication and division

Pupils should be taught to:

- recognise and write the multiplication symbol (x) and the division symbol (÷) in mathematical statements, calculating the answer with the teacher using concrete objects.
- solve word problems involving simple multiplication and division, with teacher support.

Year 2

Addition and subtraction

Pupils should be taught to:

- rapidly recall and use addition and subtraction facts to 20.
- add and subtract numbers with up to two 2-digits including using column addition without carrying and column subtraction without borrowing.
- add and subtract numbers mentally including:
  - a 2-digit number and ones
  - a 2-digit number and tens
  - two 2-digit numbers
- use subtraction in 'take away' and 'find the difference' problems.
- recognise and show that addition can be done in any order (commutative) and subtraction cannot.
- recognise and use addition and subtraction as inverse operations including to check calculations.
- solve word problems with addition and subtraction of numbers with up to 2-digits.

Multiplication and division

Pupils should be taught to:

- recall multiplication and division facts for the 2, 3, 5 and 10 multiplication tables.
- use the multiplication (x), division (÷) and equals (=) signs to read and write mathematical statements.

- write and calculate mathematical statements for multiplication and division within the multiplication tables.
- recognise and use the inverse relationship between multiplication and division to check calculations.
- ensure pupils can recognise and show that multiplication can be done in any order (commutative) and division cannot.
- solve word problems involving multiplication and division.

Year 3

Addition and subtraction

Pupils should be taught to:

- add and subtract numbers with up to 3 digits, including using columnar addition and subtraction.
- accurately add and subtract numbers mentally including: pairs of one- and 2-digit numbers; 3-digit numbers and ones; 3-digit numbers and tens; 3-digit numbers and hundreds.
- solve word problems including missing number problems, using number facts, place value, and more complex addition and subtraction.

Multiplication and division

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 3, 4, 5, 10 and 11 multiplication tables (and 8 through repeated doubling).
- write and calculate mathematical statements for multiplication and division within the multiplication tables; and for 2-digit numbers x 1-digit numbers, using mental and written methods.
- solve word problems involving the four operations, including missing number problems.

Year 4

Addition and subtraction

Pupils should be taught to:

- add and subtract numbers using formal written methods with up to 4 digits.
- accurately add and subtract numbers mentally including two 2-digit numbers.
- estimate, within a range, the answer to a calculation and use inverse operations to check answers.

Multiplication and division

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12 x 12.
- mentally perform multiplication and division calculations quickly and accurately, including multiplying by 0 and dividing by 1.
- multiply or divide 2-digit and 3-digit numbers by a 1-digit number using formal written methods; interpret remainders appropriately as integers.
- recognise and use factor pairs within 144.
- solve word problems involving the four operations.
- find the effect of dividing a 2-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths.

Year 5

Addition and subtraction

Pupils should be taught to:

- add and subtract whole numbers with up to 5 digits, including using formal written methods.
- add and subtract numbers mentally with increasingly large numbers.
- add and subtract numbers with up to three decimal places.

Multiplication and division

Pupils should be taught to:

- identify multiples including common multiples, and factors including common factors.
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- establish whether a number up to 100 is prime and recall the prime numbers up to 19.
- multiply numbers up to 4-digits by a 1 or 2-digit number using a formal written method, including long multiplication.
- accurately multiply and divide numbers mentally drawing upon known facts.
- divide numbers up to 4 digits by a 1-digit number and 10 and interpret remainders appropriately.
- multiply and divide numbers by 10, 100 and 1000.
- recognise and use square numbers and square roots and the notation for square (2) and square root (√)
- solve word problems involving addition and subtraction, multiplication and division.

Year 6

Addition, subtraction, multiplication and division

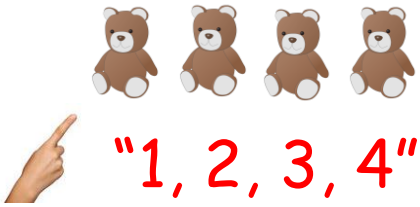
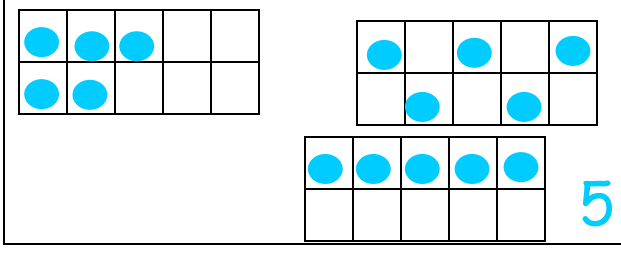
Pupils should be taught to:

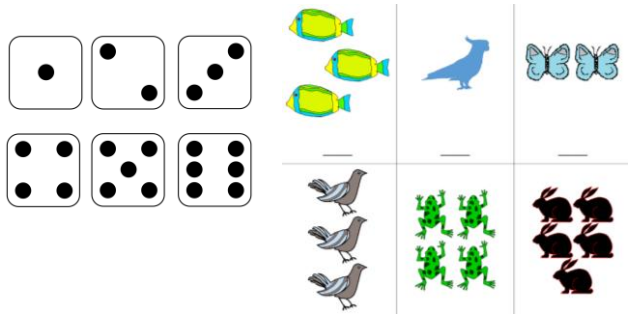
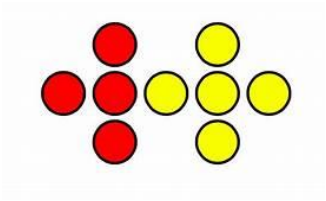
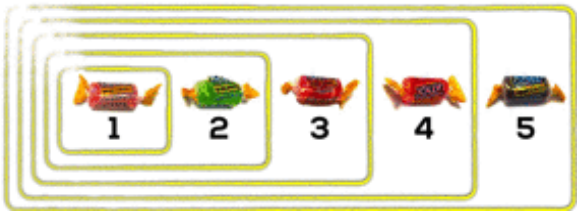
- add and subtract negative integers.
- multiply numbers with at least 4-digits by 2-digits of whole number using long multiplication.
- divide numbers up to 4-digits by a 2-digit whole number using long division, and interpret remainders as whole number remainders, fractions, decimals or by rounding.
- perform mental calculations, including with mixed operations and large numbers.
- use estimation to check answers to calculations and determine in the context of a problem whether an answer should be rounded, or written as a fraction or a decimal.
- carry out combined operations involving the four operations accurately and state the order of operations.
- solve word problems involving addition, subtraction, multiplication and division.
- identify the value of each digit to three decimal places and multiply and divide numbers up to three decimal place by 10, 100 and 1000.
- multiply and divide numbers with up to two decimal places by 1-digit and 2-digit whole numbers
- recognise and use division in the context of fractions, percentages and ratio.
- solve linear missing number problems, including those involving decimals and fractions, and find pairs of number that satisfy number sentences involving two unknowns.

The following pages show our schools' written calculation methods for maths. They are organised by number operations – Addition (+), Subtraction (-), Division (÷) and Multiplication (x). Each section shows the written calculation methods for each operation starting from simple methods progressing to more advanced ones. Children will move through these stages according to ability

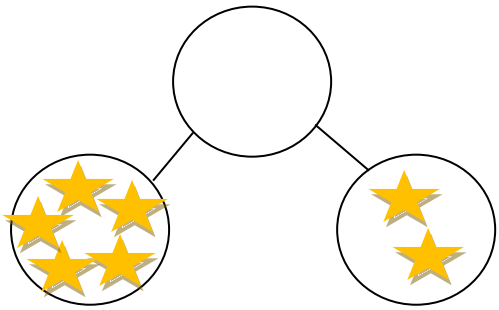
EYFS

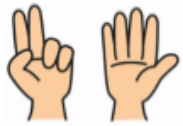
Principles of early counting

1. One-to-one correspondance principle  "1, 2, 3, 4"	This involves assigning one number name for each of the items to be counted.
2. The stable-order principle 0,1,2,3,4,5,6,7,8,9,10 not 0,1,2,4,5,6,8,10	To be able to count also means knowing that the list of words used must be in a repeatable order and used reliably.
3. The cardinal principle *This builds upon the 1:1 and the stable-order principle.*  "1,2,3,4,5. There are 5"	The child will understand: - that the number name allocated to the final object in a collection represents the number of items in that collection **without repeating the count**. (e.g. the '4-ness' of 4). - The final number not only 'names' the final object, signalling the end of the count, but also tells you how many objects have been counted.
4. The abstraction principle *This builds upon the 1:1, stable-order and caridinal principle.* This is a key skill when 'counting on'. e.g." Close your eyes, can you count the number of pennies I drop into the tin?"	Children require an understanding that we can count any collection of objects, whether tangible or not. For example, the quantity of five large items is the same count as a quantity of five small items or a mixed group of five small and large things.
5. The order-irrelevance principle 	The order in which items are counted is irrelevant. Children have an understanding of **order irrelevance** when they are able to count a group of items starting from different places. For example, counting from the left-most item to the right-most and vice versa.
6. The conservation principle  5	Understanding that the count for a set group of objects stays the same no matter whether they are spread out or close together.

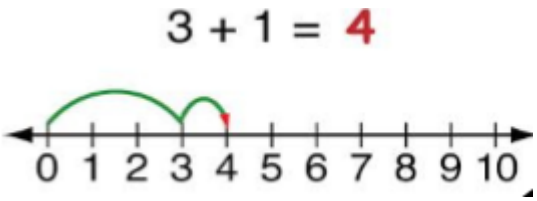
8. Subitising Perceptual   "I can see 5 and 3"	Children have the ability to "see" or visualize a small amount of objects and know how many there are without counting. Perceptual subitising when it is a group of up to 5 objects. Conceptual subitising takes place when you are still able to "see" how many objects are in group, but the number of objects is too large to subitize without decomposing into two or more smaller groups.
9. Hierarchical Inclusion 	Children understand that all numbers preceding a number can be or are systematically included in the value of another selected number. For example, knowing that within a group of 5 items, there is also a group of 4 items within that group; 3 items within that group; 2 items… and so on.
10. One more/less than a given number	Understanding that as you move up the counting sequence (or forwards), the quantity increases by one and as you move down (or backwards), the quantity decreases by one.
11. The concept of zero "Show me 0" Children show nothing.	The understanding that zero is nothing and cannot be visualised but is still a significant number.
When children have mastered these concepts, they will have the ability to achieve; 'Children reliably count up to 20 objects'.	

ADDITION





Early Recording:



See conceptual subitising.

Children begin to combine groups of objects or pictures and use concrete apparatus. They will be encouraged to say the number sentences aloud, e.g. three and two is five.

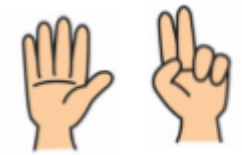
Use the part-part whole model to show which numbers add together to make another number. Initially, physically moving the objects to make the whole and then progressing to a written numeral.

Children will begin to use recording skills to draw pictures or use number cards to make their number sentences. They may use language like, 'two plus two equals four.'

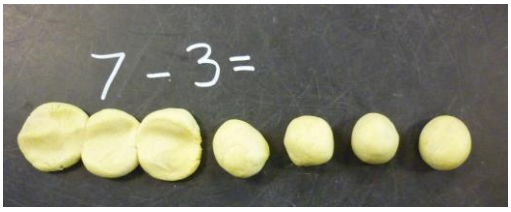
Numicon may be used as a concrete resource to show the number sentence.

Number lines are used to solve addition calculations and worded problems. The children jump along the number line to 'count on'. See abstraction principle.

SUBTRACTION



Children develop an understanding of what 'less' means and be able to say what is one less than a given number. 'Fewer' should be modelled language.



Children begin to use objects, pictures and concrete apparatus to relate subtraction to 'taking away' by counting how many are left.

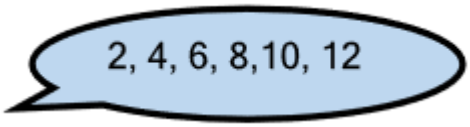
Children are encouraged to speak their number sentence aloud, 'seven take-away three makes 4.'

Number lines are used so that the children can jump back to 'count down'.

MULTIPLICATION

How many groups of 2 are there? 3 groups of 2 = 6

Children begin with concrete representations using objects.



Begin to count in 2's, 5's and 10's both in context with objects, then pictorially and then counting aloud as the abstract.

Real-life contexts are used, and children are encouraged to speak the number sentence, 'Two lots of five on my hands is 10 fingers'.

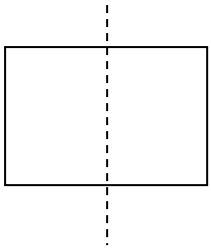
"How many legs on four ducks?"

Children will be asked questions like, 'How many legs are on 4 ducks?'

How many wheels are there altogether?

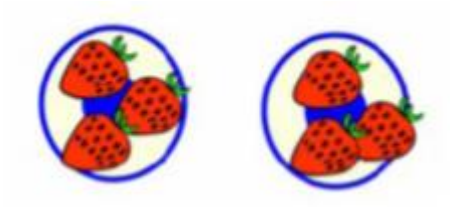
Real-life contexts to count repeated groups of the same size.

DIVISION



Practical concrete representations

- Cut/ fold in half



Division can be introduced through halving or sharing an equal amount into 2 groups.

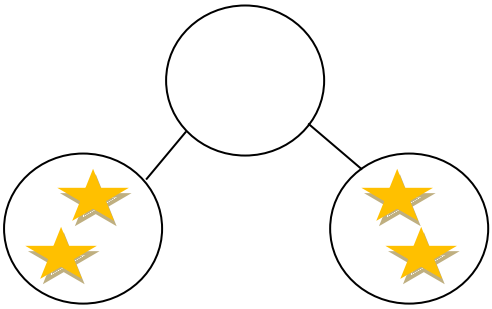
Children begin with mostly pictorial representations linked to real life contexts:

Grouping Model Mum has 6 socks. She grouped them into pairs. How many pairs did she make?

Sharing Model I have 10 sweets. I want to share them with my friend. How many will we have each?

12 shared equally by 3 is 4

Children have a go at recording the calculation that has been carried out: e.g. by drawing pictures in groups or by arranging concrete apparatus into groups.



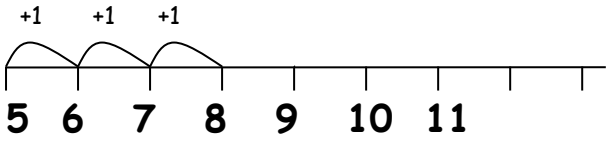
Use the part-part whole model to show half of a number. Initially, physically moving the objects from the whole to make the two parts and then progressing to an abstract written numeral.

ADDITION

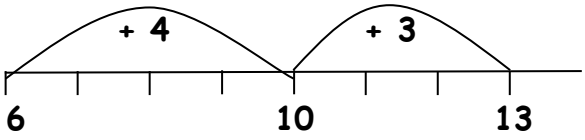
Children are taught to understand addition as combining two sets and counting on.

Calculation Method	Explanation
Year 1	
2 + 3 = At a party, I eat 2 cakes and my friend eats 3. How many cakes did we eat altogether? 	Children draw a picture to help them work out the answer.
7 + 4 = 7 people are on the bus. 4 more get on at the next stop. How many people are on the bus now? **..... ....** We would then progress to; **7 + ... = 11**	Children use dots or symbols to represent objects (quicker than drawing a picture) We would then progress to counting on from 7.

5 + 3 =



6 + 4 + 3 =



Children use a number line to record jumps made by using single jumps…

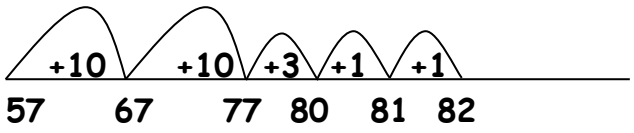
…or larger jumps.

Year 1 – 2 (transitioning)

57 + 25 =

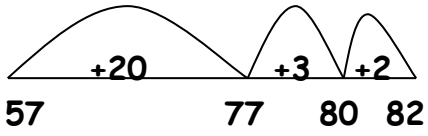
My sunflower is 57cm tall. It grows another 25cm. How tall is it now?

Method 1



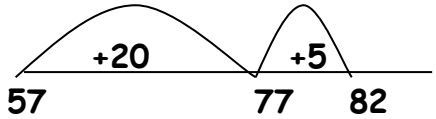
Method 2

57 +25 =



Method 3

57 + 25 =



Drawing an **empty number line** helps children to record the steps they have taken in a calculation.

Start on 57 count on a jump of 10 to land on 67. Then add on another jump of 10 to land on 77. Then add on 3 to land on 80 then a jump of 1 to land on 81 and 1 to land on 82.

Start on 57. Add on 20 to land on 77. Then add 3 to get to 80 then 2. This is much more efficient than counting on in ones.

At all times, it is important to reinforce number bonds to 10.

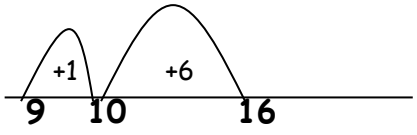
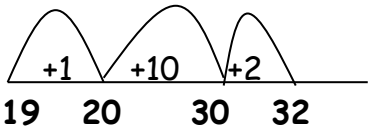
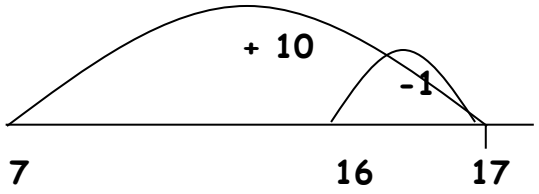
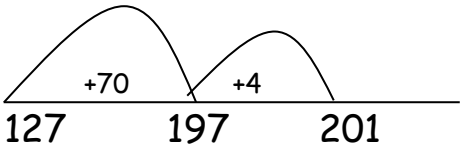
Start on 57. Add on 20 to land on 77 then add 5 to land on 82.

Children may also **partition** numbers – **57 + 25 =**

50 + 20 = 70

7 + 5 = 12

70 + 12 = 82

7+9=  **13 + 19=**  	Draw an empty number line. Children will be taught to place the largest number at the left side of the line. Add 1 to get to 10. Then add the 6. This method is also used when adding 19, 29, 39 etc.
7 + 9 = (7 + 10) – 1= 16  	Children use a sound understanding of adding 10 to adapt calculations. Instead of adding 9, they add 10 then **adjust** the calculation by subtracting 1. This is also used for adding other numbers e.g. 15 + 19 (15 + **20**, - 1) This is a mental strategy and children are introduced to this using a 100 square.
127 + 74 = There are 127 boys and 74 girls in a school. How many children are there altogether?  	Children will start their number line at 127. Add a jump of 70 to 197. Either add 3 then 1 or simply a jump of 4 to land on 201.

Year 2	
20 + 4 30 + 5 50 + 9 2 4 + 3 5 5 9	Towards the end of Year 2 children will be introduced to a formal written method. No carrying is involved at this early stage and the expanded method should be taught first to ensure children understand the place value. The value of the numbers should not exceed 2 digits.
Year 3	
1 2 7 + 7 4 100 + 20 +7 + 70 +4 100 + 90 + 11 =201	Children will be taught **written method**s for those calculations they cannot do 'in their heads'. **Expanded methods** build on mental methods and make the value of the digits clear to children. The language used is very important **(7+4, 20+70, 100+0, then 100+90+11 - *add this mentally*** *** In this expanded method, when children get to the stage of adding their partitioned digits together they may be required to 'carry' numbers (see below).** The value of the numbers should not exceed 3 digits.
2 9 8 3 5 8 1 1 6 5 6	When children are confident using the expanded method, this can be 'squashed' into the traditional compact method. (Carrying!)

Year 4

2786 + 2568 =

2 786 people visited the museum last month. The numbers increased by 2 568 this month. How many people altogether visited this month?

```
  2 7 8 6
+ 2 5 6 8
  5 3 5 4
    1 1 1
```

When children are confident using the expanded method, this can be 'squashed' into the traditional compact method. (Carrying!)

The value of the numbers should not exceed 4 digits.

Year 5

```
2 0 + 4 + 0 . 5
3 0 + 9 + 0 . 8
5 0 + 1 3 + 1 . 3 = 6 4 . 3
```

```
2 4 . 5
3 9 . 8
6 4 . 3
  1   1
```

Add whole numbers up to 5 digits. Decimals numbers will be introduced this year. Children will start with the expanded method to ensure their understanding of place value is secure before moving onto the compact method.

Year 6

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

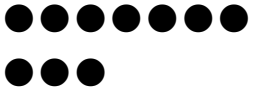
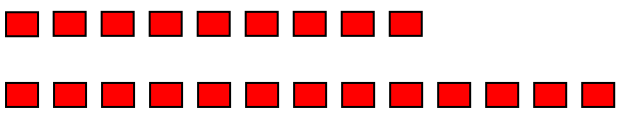
Year 6 will use the compact method and add larger numbers and decimals up to 3 places.

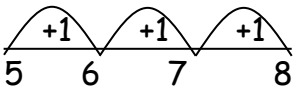
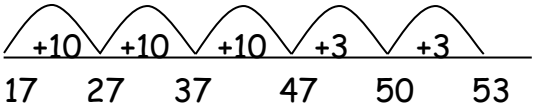
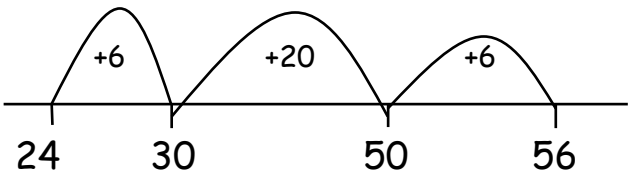
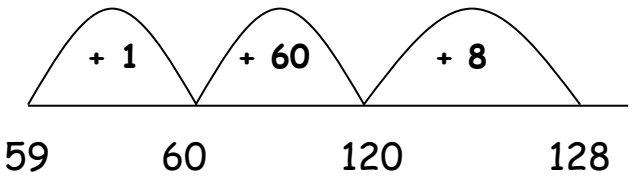
In order to keep the place value the children may add 0s in the empty decimal columns.

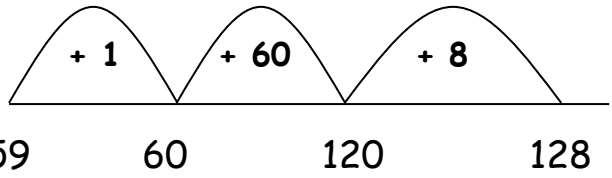
SUBTRACTION

Children are taught to understand subtraction as taking away and finding the difference (counting up).

Calculation Method | Explanation

Year 1	
5 - 2 = I had five balloons but two burst. How many did I have left?  Take away A teddy bear costs £5 and a doll costs £3. How much more does the bear cost?  ? ? Find the difference	Drawing a picture helps children to visualise the problem.
7 - 3 = Mum baked 7 biscuits. I ate 3. How many were left?  Take away Lisa has 7 felt tip pens and Tim has 3. How many more does Lisa have?  Find the difference Sarah has 9p and John has 13p. How much more does John have? 	Using dots or tally marks is quicker than drawing a detailed picture.

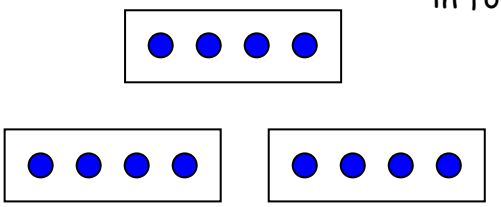
Year 1 - 2	
COUNTING UP/Find the difference **8 - 5 = 3**  **53-17= 36**  	Children are taught to **count up** in order to subtract or '**find the difference**'. The children count up from 5 in jumps of 1 to get to 8. They then count the jumps to get the answer. Count up from 17 by adding 3 jumps of 10 (or simply a jump of 30). Then, 2 jumps of 3 to reach 53. Add the jumps up to get 36 which is the difference between the two numbers.
56 - 24 = The library owns 56 books. 24 are out on loan. How many are on the shelves?  **128 – 59=**  	Children could **count up** (from the smallest number to the biggest) using an empty number line. It is easiest to count up to a multiple of 10 or 100 (a friendly number). This method can be used with any numbers, even decimals.

Year 2	
80 + 9 **- 50 + 5** **30 + 4 = 34** **8 9** **- 5 5** **3 4**	Children will be introduced to a formal written method. No exchanging (decomposition) from other columns is introduced at this early stage and the expanded method should be taught first to ensure children understand the place value. The value of the numbers should not exceed 2 digits.
Year 3	
128 – 59=  59 60 120 128	For calculations where mental methods can be used, counting on in jumps will still be the main method used. The children will develop their ability to perform this mentally and with larger numbers.
Expanded decomposition **749** **- 273** _____ →	600 140 ~~700~~ + ~~40~~ + 9 200 + 70 + 3 400 + 70+ 6 = 476	When children are secure using the column method, expanded decomposition is introduced. Partition the numbers and set out in **columns**. Always start subtracting the **units** first. If the top number is smaller than the bottom number, then you will need to take from the column on the left. Remember to adjust the columns to show the new amounts. Finally, recombine the answers to give your final answer. The value of the numbers should not exceed 3 digits.

Decomposition $\begin{array}{r} {}^{6}\not{5}\,{}^{1}\not{7}\,2 \\ -\ 2\ 4\ 5 \\ \hline 3\ 2\ 7 \end{array}$	Once the children are secure with expanded, they can move onto to the shortened/compact method. This is just the same as above, but the numbers are not partitioned.
Year 4	
$\begin{array}{r} {}^{2}\not{3}\ {}^{1}5\ {}^{3}\not{4}\ {}^{1}7 \\ -\ 2\ 6\ 2\ 8 \\ \hline 0\ 9\ 1\ 9 \end{array}$	The children will use the same methods as year 3; column and decomposition but the value of the digits should not exceed 4 digits.
Year 5	
$\begin{array}{r} {}^{2}\not{3}\ {}^{1}5\ {}^{3}\not{4}\ {}^{1}7.{}^{7}\not{8}\,{}^{1}5 \\ -\ 2\ 6\ 2\ 8.2\ 7\ 8 \\ \hline 0\ 9\ 1\ 9.6\ 0\ 7 \end{array}$	The children will use the same methods as in years 3 and 4; column and decomposition but the value of the digits should not exceed 5 digits. Decimals will be introduced up to 3 decimal places – in this instance, expanded decomposition should be taught first to ensure all children understand the place value.
Year 6	
$\begin{array}{r} {}^{2}\not{3}\ {}^{1}5\ {}^{3}\not{4}\ {}^{1}7.{}^{7}\not{8}\,{}^{1}5 \\ -\ 2\ 6\ 2\ 8.2\ 7\ 8 \\ \hline 0\ 9\ 1\ 9.5\ 0\ 7 \end{array}$	The children will use the same methods as in years 3, 4 and 5; column and decomposition with a range of larger numbers. They will also add and subtract negative integers – this will be done using a number line.

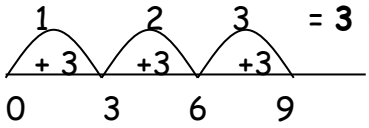
DIVISION

Children are taught to understand division as sharing and grouping

Calculation Method	Explanation
Year 1	
6 ÷ 2 = 6 Easter eggs are shared between 2 children. How many eggs do they get each?  Sharing between 2 There are 6 Easter eggs. How many children can have two each?  Grouping in twos	More pictures! Drawing often gives children a way into solving the problem.
Year 1 and 2	
12 ÷ 4 = 4 apples are packed in a basket. How many baskets can you fill with 12 apples? Grouping in fours 	Dots or tally marks can either be shared out one at a time or split up into groups.

Year 2

9 ÷ 3= 3



= 3 lots of/sets of 3

The above method progresses into a number line. You add on **'lots of 3' or 'sets of 3'** until you reach 9. You then count up how many lots of 3 you have added on to get the answer **3**.

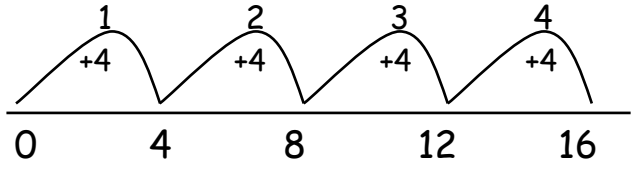
By the end of Year 2 the children will be introduced to the concept of remainders.

Year 3

Mental Strategy

16 ÷ 4 = 4

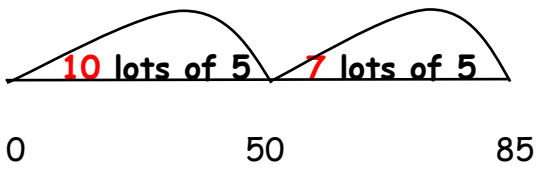
A chew bar costs 6p. How many can I buy with 24p?



To work out how many lots of 4 there are in 16, draw **jumps** of 4 along a **number line. This shows you need 4 jumps of 4 to reach 16.**

Mental Strategy

85 ÷ 5 =



It would take a long time for the children to jump in fives to 85 so children can jump on in bigger '**jumps**'.

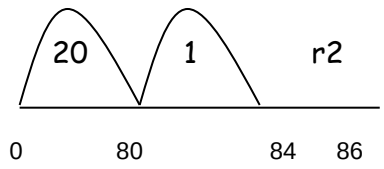
A jump of 10 groups of 5 takes you to 50. Then you need another 7 lots of 5 which is 35 will take you to 85. Altogether this is **17 fives.**

Calculations should be 2 digit by 1 digit.

Mental Strategy

86 ÷ 4 =

I need 86 chairs for a concert. I arrange them in rows of 4. How many rows do I need?



If the number you are dividing by (4) cannot go into the number any more, this is the remainder!

KNOWN FACTS
4 x 2 = 8
4 x 20=80

This method is known as **counting up on a number line.**

In this example, you are counting up in jumps of multiples of 4.

Using their **KNOWN FACTS** children will know 4 x 2=8 so 4 x 20=80

So first add on a jump of 20 lots of 4 and land on 80.

You are left with 6.

Then add on a jump of 1 lot of 4 which is 4 and land on 84, to leave 2.

Altogether, that is 21 fours with a remainder of 2.

Calculations should be 2 or 3 digit by 1 digit and children should be taught to interpret the remainder appropriately.

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Year 4/5

Short Division (Bus-stop)

$$\begin{array}{r} 19 \\ 4\overline{)\,{}^{3}76} \end{array}$$

$$\begin{array}{r} 027\text{ r }1 \\ 5\overline{)\,1\,{}^{1}3\,{}^{3}6} \end{array}$$

Teacher would explain to the children that we ignore place value when teaching short division as a strategy.

Firstly, work out how many fours fit into 7. Write the **answer above** 7 and the **reminder** in front of the next digit of the number to be divided.

Then count up in fours to see how many now fit into 36 and write the answer above the digit 6.

If the divisor does not fit exactly into the final number, you will be left with a remainder to be recorded next to your answer.

E.g. 136 ÷ 5 = 27 r 1

Year 5/6

Short Division

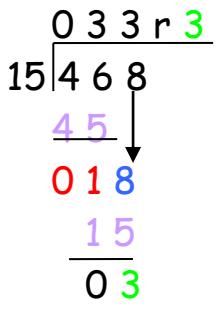
$$\begin{array}{r} 1923 \\ 4\overline{)\,7\,{}^{3}6\,9\,{}^{1}2} \end{array}$$

In year 5 children will divide up to 4 digits by a 1 digit number and interpret remainders appropriately

Firstly, work out how many fours fit into 7. Write the **answer above** 7 and the **reminder** in front of the next digit of the number to be divided.

Teacher would explain to the children that we ignore place value when teaching short division as a strategy.

	Then count up in fours to see how many now fit into 36 and write the answer above the digit 6. If the divisor does not fit exactly into the final number, you will be left with a remainder to be recorded next to your answer.
1 2 0 r 5 8) 9 ^{1}6 5 1 2 0 and 5/8 8) 9 ^{1}6 5 The 8 becomes the denominator of the fraction remainder. 1 2 0 . 6 2 5 8) 9 ^{1}6 5 . ^{5}0 ^{2}0 ^{4}0	Remainders can be interpreted as fractions, decimals or rounding. E.g. 965 ÷ 8 = 120 r5 = 120 5/8 = 120.625 = 121 (rounded to the nearest whole number) Examples will be taught and practised that include 0 and when divisors divide exactly.

Year 5/6	
Long Division	
	Teacher would explain to the children that we ignore place value when teaching long division as a strategy. Long division requires the children to be competent and confident with their tables, and subtraction before they can use it as a division strategy. 468 ÷ 15 How many 15s in 4? The answer is 0 so this is placed above the 4, above the 'bus-stop'.. The next question is how many 15s are in 46? (We have put the 4 and 6 together to make 46). The answer is 3, so this is placed above the 6, above the division gate. 3 x 15 is 45, this is written under the 46 and a subtraction calculation is done to work out the remainder which is 1. The remaining digit (8) is then brought down to join the 1 to form 18. So the next question we ask is; how many 15s are there in 18? The answer is 1, so this is written above the 8, above the division gate. 1 x 15 is 15, this is written under the 18 and a subtraction calculation is done to work out the final remainder, which in this example is 3.

OR

Short Division

The bus-stop method still works well and most children find this an easy and efficient method to use.

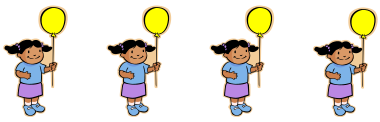
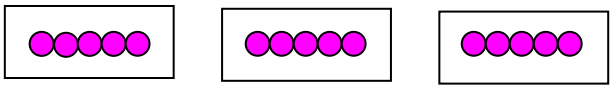
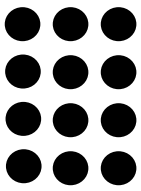
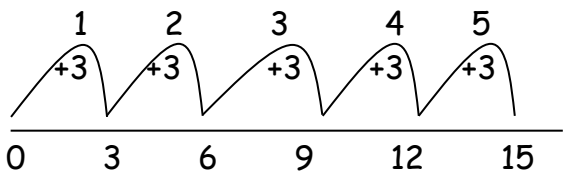
```
      0  3  3   r 3
15    4 46 18
```

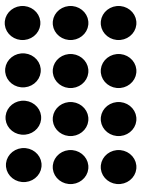
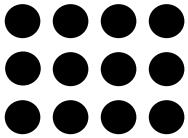
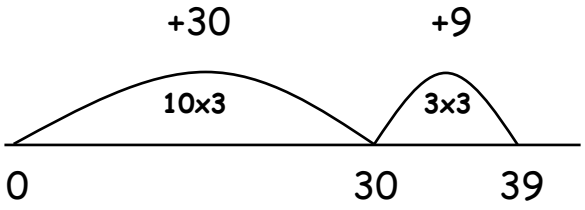
15
30
45
60

With this method, the children stick with the simple bus-stop approach but will need to write the times table for the 2 digit number that they are dividing by. In this case, the 15 x table is written down the side and used to help the children find the remainders.

MULTIPLICATION

Children are taught to understand multiplication as repeated addition. It can also describe an array (see below).

Calculation Method	Explanation
Year 1	
2 x 4 = Each child has two feet. How many feet do four children have?  **2 + 2 + 2 + 2**	A **picture** can also be useful for early multiplication. We say "2, four times."
5 x 3 = There are 5 cakes in a pack. How many cakes in 3 packs?  **5 + 5 + 5**	Dots or tally marks are often drawn in groups. This shows 3 groups of 5.
3 x 4 = A chew costs 4p. How much do 3 chews cost?  3 lots of 4 3 sets of 4 3(4)	Drawing an **array** (**4 rows of 3** or **3 columns of 4**) gives children an **image** of the answer. It also helps **develop the understanding that 4x3 is equivalent to 3x4.**
3 times table visual aid.  	The children will be taught their times tables and division facts using a number line as a visual aid.

Year 2	
3 x 4 = A chew costs 4p. How much do 3 chews cost?  3 lots of 4 3 sets of 4	Drawing an **array** (**4 rows of 3** or **3 columns of 4**) gives children an **image** of the answer. It also helps **develop the understanding that 4x3 is equivalent to 3x4.**
4 x 3 = A chew costs 3p. How much do 4 chews cost?  4 lots of 3 4 sets of 3	Drawing an **array** (**3 rows of 4** or **4 columns of 3**) gives children an **image** of the answer. It also helps **develop the understanding that 4x3 is equivalent to 3x4.**
13 x 3 = 39 There are 13 biscuits in a packet. How many biscuits in 3 packets?  	When numbers get bigger, it is inefficient to do lots of small jumps. **Split 13 into parts** (10 and 3). This gives you **two jumps** (**10x3** and **3x3**). The answer is the number you land on 39.

Year 3	
Mental Strategy **26 x 3 =** Partitioning. 20 x 3 = 60 6 x 3 = 18 60 + 18 = 78 KNOWN FACTS 2 x 3 = 6 20 x 3 = 60	Children use the partitioning method to multiply mentally and when multiplying by a unit (single digit). Partition 26 (into 20 and 6) and use KNOWN FACTS to multiply by 3. 2x3=6 so 20 x 3 = 60 6 x 3 = 18 Then add the answers together 60 + 18 = 78.
Expanded Column Multiplication H T U 3 4 x 6 2 4 (4 x 6) 1 8 0 (30 x 6) 2 0 4 1	Children use short multiplication to multiply TU x U Starting with the units column U x U (4 x 6 = 24), place the answer underneath in line with the place value. Then multiply T x U (30 x 6 = 180), writing the answer underneath the 24 so that they can be added.
Year 4	
Short Multiplication H T U 3 4 x 6 2 0 4 2	Children use short multiplication to multiply TU x U To understand place value, we would explain the following: Starting with the units column U x U (6 x 4= 24). Place the 4 from 24 into the answer in the units column and carry the 2 tens below the multiplier in the tens column.

	Next, multiply T x U (30 x 6 = 180). Add your 2 carried tens from below the answer column to equal 200. This is 20 Tens therefore you write 20 in the answer column under H and T. Final answer =204 *When teaching the children our dialogue would be:* *Step 1- U x U 4 x 6 = 24, put the 4 in the answer and carry the 2.* *Step 2 T X U 3 x 6= 18, add the 2 = 20. Put the 20 in the answer box. Final answer= 204.*
Short Multiplication Th H T U 3 2 5 X 7 ——— 2 2 7 5 ——— 1 3	Children use short multiplication to multiply HTU x U To understand place value we would explain the following: Starting with U x U (5 x 7= 35). Place the 5 from the 35 into the answer in the units column and carry the 3 tens below the multipier in the tens column. Then multiply T x U (20 x 7= 140) Add your carried 3 tens (140 +30=170) Place the 7 Tens in the Tens column of your answer and carry the 1 hundred below the multipler in the hundreds column. Next multiply the H x U (300 x 7= 2100). This is 21 hundreds so now add the carried 1 hundred to make 22 Hundreds (2200). Finally place the 22 under the Th and H columns. Final answer = 2275 *When teaching the children our dialogue would be:* *Step 1- U x U 5 x 7 = 35 put 5 in the answer carry the 3.*

	Step 2 T x U 2 X 7 = 14 add the 3 = 17. Put the 7 in the answer carry the 1. *Step 3- H x U 3 x 7=21 add the 1 = 22. Write 22 in the answer box.* *Final answer = 2275*
Year 5	
Short Multiplication Th H T U 1 3 2 5 X 7 _____ 9 2 7 5 _____ 2 1 3	Children use short multiplication to multiply ThHTU x U To understand place value, we would explain the following: Starting with U x U (5 x 7= 35). Place the 5 from the 35 into the answer in the units column and carry the 3 tens below the multiplier in the tens column. Then multiply T x U (20 x 7= 140). Add your carried 3 tens (140 +30=170). Place the 7 Tens in the Tens column of your answer and carry the 1 hundred below the multiplier in the hundreds column. Next multiply the H x U (300 x 7= 2100). This is 21 hundreds so now add the carried 1 hundred to make 22 Hundreds (2200). Finally. multiply the Th x U (1000 x 7). Add your carried 2 thousands to make 9 thousands (9000). Finally place the 22 under the Th and H columns. Final answer = 2275 *When teaching the children our dialogue would be:* *Step 1- U x U 5 x 7 = 35 put 5 in the answer carry the 3.* *Step 2 T x U 2 X 7 = 14 add the 3 = 17. Put the 7 in the answer carry the 1.*

	Step 3- H x U 3 x 7=21 add the 1 = 22. Write 22 in the answer box. *Final answer = 9275*
Long Multiplication. 59 x 26 Th H T U 5 9 X 2 6 3 5 4 5 1 1 8 0 1 1 1 5 3 4 1	*When teaching the children our dialogue would be:* *Step 1- U x U 6 x 9= 54 put the 4 in the answer and carry the 5 below that line.* *Step 2- U x T 6 x 5= 30. Add the 5 to make 35. Put 35 in the answer, First line answer 354.* *Step 3- Put a 0 in the answer under the units column to hold the place value as you are about to multiply everything by 10.* *Step 4 T x U 2 x 9=18, put 8 in the answer, carry 1 below that line.* *Step 5 T X T 2 X 5= 10, add the 1 = 11, put 11 in the answer. Second line answer 1180.* *Step 6 add first and second line answers together. Final answer= 1534.*
Year 6 As year 5, with larger numbers and decimals 4 2 . 5 X 2 1 4 2 5 8 5 0 0 1 8 9 2 .5 Decimal point put into the answerto give 1 decimal place.	The method for teaching long multiplication with larger numbers is exactly the same. When multiplying decimals, children will be taught to ignore the decimal point whilst calculating the solution. They will then count how many numbers in the question were AFTER the decimal point. This provides the position of the decimal in the solution.
