Calculation Policy

Approval Level:	Governing Body
Date Agreed:	Spring Term 2022
Next Review:	Spring Term 2023

The following Calculation Policy has been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school.

Age-Related Expectations

The Calculation Policy is organised according to age-related expectations as set out in the National Curriculum 2014 and the method(s) shown for each year group should be modelled to the vast majority of pupils. However, it is vital that pupils are taught according to the pathway that they are currently working at and are showing to have 'mastered' a pathway before moving on to the next one. Of course, pupils who are showing to be secure in a skill can be challenged to the next pathway as necessary.

Choosing a Calculation Method

Before pupils opt for a written method, they should first consider these steps:

Concrete, Visual, Abstract:

The Maths curriculum at Martlesham Primary Academy is based on the concrete, visual and abstract approach.

Pupils are first introduced to an idea or skill by acting it out with real objects (a hands-on approach). Pupils then are moved onto the visual stage, where pupils are encouraged to relate the concrete understanding to pictorial representations. The final abstract stage is a change for pupils to represent problems by using mathematical notion. Whilst this calculation policy aims to show the CVA approach to the different calculations, it is not always noted further up the year groups.

However, it is expected the CVA approach is used continuously in all new learning and calculations even when not noted.

In EYFS, the children are introduced to this through "Do it, Draw it, Think it" and this is referred to on their working wall to support their understanding of these concepts, enabling the children to progress through the stages should they be ready.

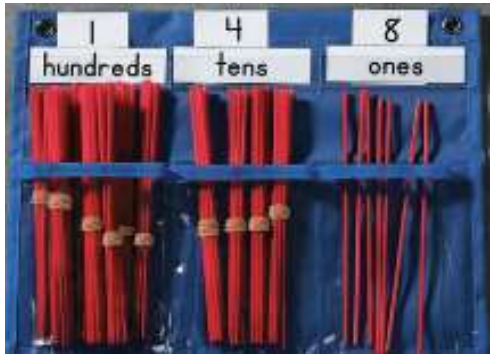
Examples of concrete resources that could be used for each operation are noted at the start of each section.

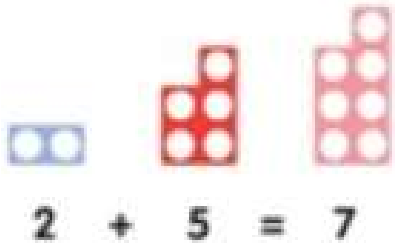
Concrete Resources Addition

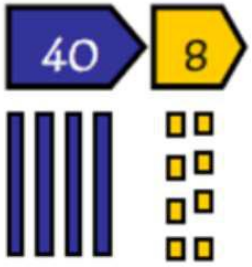
Examples of concrete resources that can be used for addition:

100 square
Number lines
Bead strings
Straws
Dienes
Place value cards
Place value dice
Place value counters
Numicon
Cars/dinosaurs (anything that interests the child)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



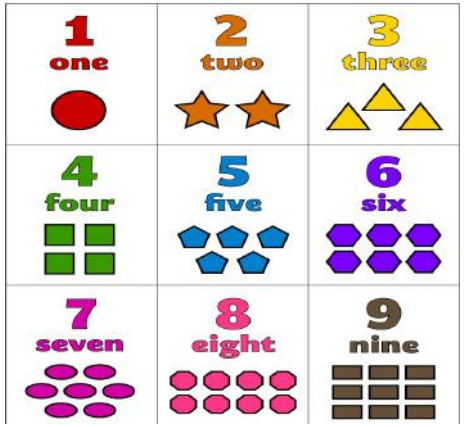




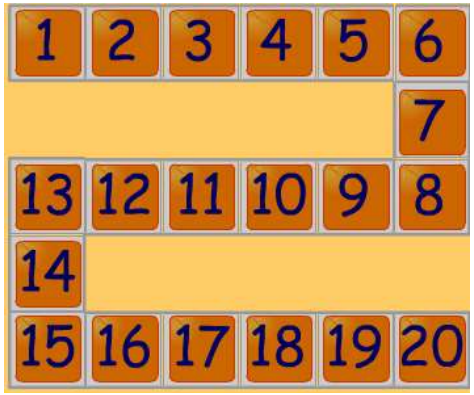
EYFS

Addition

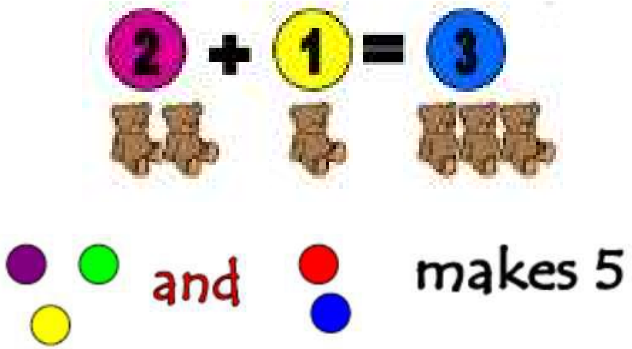
Recognise numbers up to 20 and understand the meaning of each number by recognising and knowing their clusters.



Count on in ones and say which number is one more than a given number using a number line or number track to 20.



Begin to relate addition to combining two groups of objects using practical resources, role play, stories and songs.



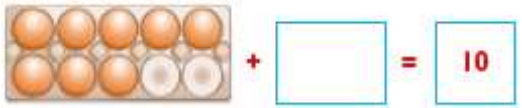
Know that counting on is a strategy for addition. Use numbered number lines to 20.

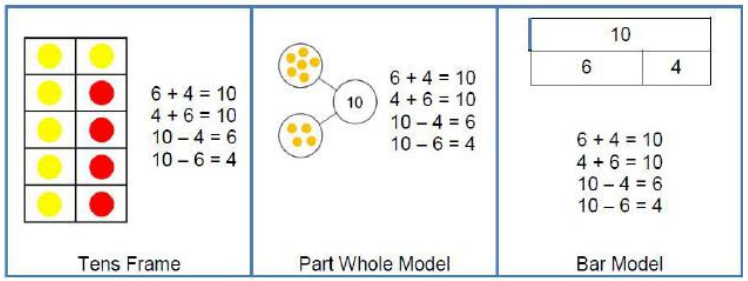
Early learning goals:

- ✓ Count reliably with numbers from 1 to 20, place them in order.
- ✓ Say which number is one more than a given number.
- ✓ Using quantities and objects, they add two single-digit numbers and count on to find the answer.

Year 1 Addition

Memorise and reason with number bonds to 10 and 20 in several forms.

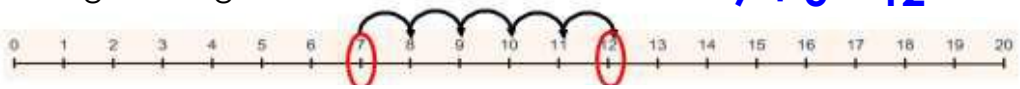




Use concrete resources and a number line to support the addition of numbers. Know and use the strategy of finding the larger number, and counting on in ones from this number.

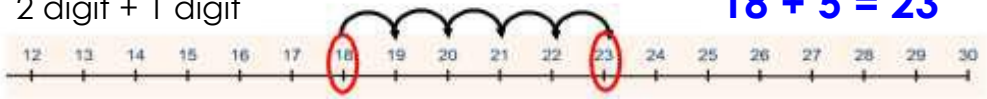
1 digit + 1 digit

7 + 5 = 12



2 digit + 1 digit

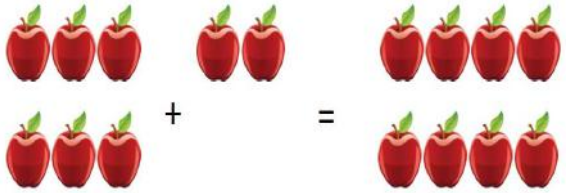
18 + 5 = 23



Begin to use the + and = signs to write calculations in a number sentence.

Solve one-step problems using concrete objects and pictorial representations.

Tom picks 6 apples and Raj picks 2 apples.
How many apples do they have altogether?

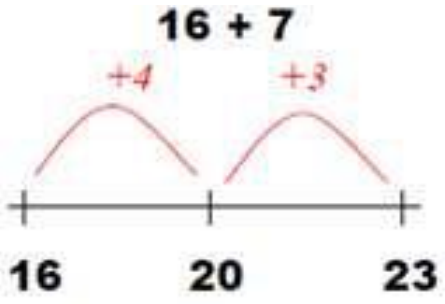


Year 1 statutory requirements:

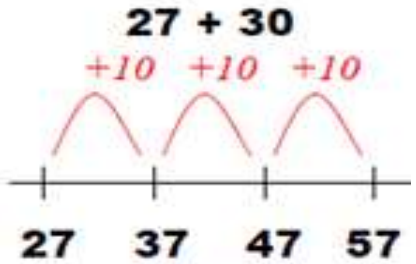
- ✓ Count to and across 100, forwards beginning with 0 or 1, or from any given number.
- ✓ Given a number, identify one more.
- ✓ Read, write and interpret mathematical statements involving addition (+), and equals (=) signs.
- ✓ Represent and use number bonds and related subtraction facts within 20
- ✓ Add one-digit and two-digit numbers to 20, including zero.
- ✓ Solve one-step problems that involve addition using concrete objects and pictorial representations, and missing number problems.

Year 2 Addition

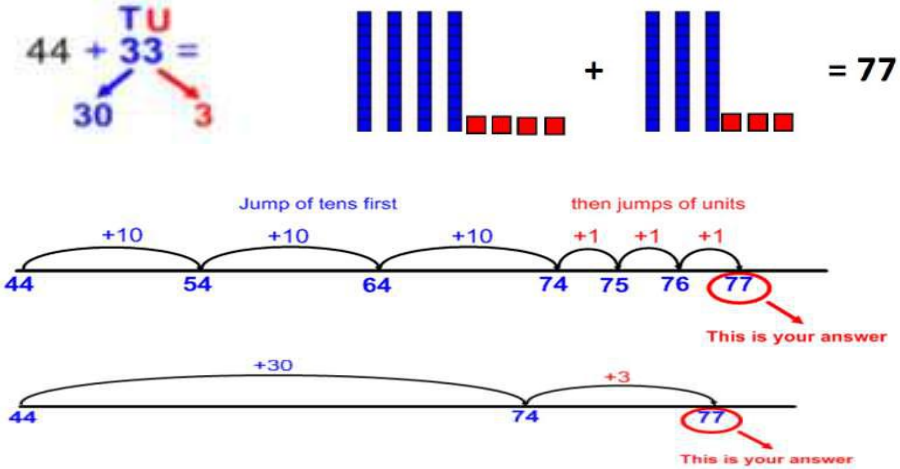
Add a 2-digit number and ones



Add a 2-digit number and tens



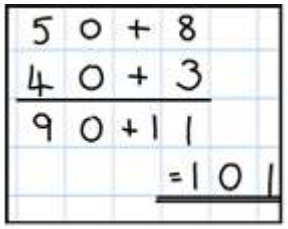
Use partitioning to add two 2-digit numbers using concrete resources and/or a numbered number line and then progressing to an empty number line.



Add pairs of 2-digit numbers, using the partitioned column method which **do** cross the tens boundary.

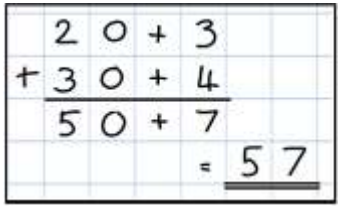
When ready, move onto looking at the compact column addition method (see Year 3).

58 + 43 =



Add pairs of 2-digit numbers, moving to the partitioned column method which **do not** cross the tens boundary.

23 + 34 =



Year 2 statutory requirements:

- ✓ Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts to 100.
- ✓ Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
- ✓ Add numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers.
- ✓ Solve problems with addition including those involving numbers, quantities and measures.

Year 3 Addition

Introduce the **expanded column addition** method:

236 + 73 =

	2	3	6
+		7	3
			9
	1	0	0
	2	0	0
	3	0	9

Add the **ones** first, in preparation for the compact method.

In order to carry out this method:

- Children need to recognise the value of the hundreds, tens and ones without recording the partitioning.
- Children need to be able to add in columns.

Move to the compact **column addition** method, with 'carrying'.

236 + 73 =

236

+ 73

309

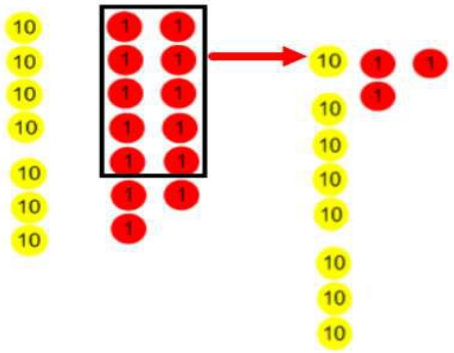
1

Add the **ones** first.

'Carry' numbers **underneath** the bottom line.

Remind children that the actual value is **'thirty add seventy'**, but we say **'three add seven'** because it is already in the tens column.

Use place value resources to support understanding of 'carrying'.



Year 3 statutory requirements:

- ✓ Find 10 or 100 more than a given number.
- ✓ Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).
- ✓ Add numbers with up to three digits, using formal written methods of columnar addition.

Year 4 Addition

By the end of year 4, pupils should be adding numbers up to 4 digits using compact column addition method.

5271 + 2357 =

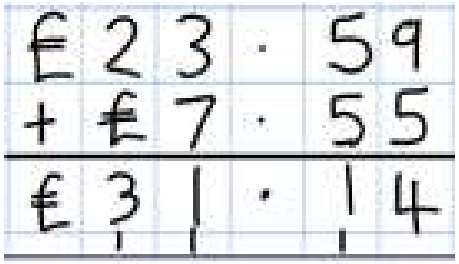
$$\begin{array}{r} 5\,2\,7\,1 \\ +\,2\,3\,5\,7 \\ \hline 7\,6\,2\,8 \\ \hline 1 \end{array}$$

Add the **ones** first.

'Carry' numbers **underneath** the bottom line.

Remind children that the actual value is **'two hundred add three hundred'**, but we say **'two add three'** because it is already in the hundreds column.

The children should then apply this method to money and measurement values.



The decimal point should be aligned in the same way as the other place value columns, and must remain in the same column in the answer row.

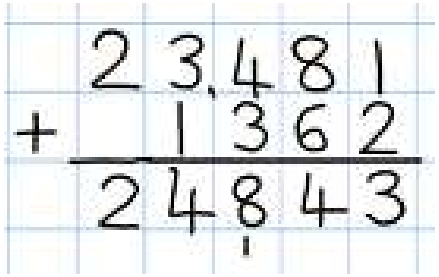
Year 4 statutory requirements:

- ✓ Find 1000 more than a given number.
- ✓ Add numbers with up to 4 digits using the formal written methods of columnar addition where appropriate.
- ✓ Solve addition two-step problems in contexts, deciding which operations and methods to use and why.

Years 5 and 6 Addition

The children should now be moving onto adding numbers with more than 4 digits using the compact column method.

23481 + 1362 =



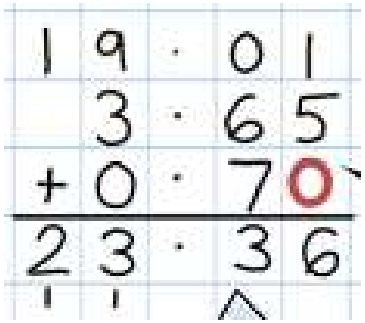
When adding decimals, it is essential that the decimal point does not move and is kept in line. Where necessary, a zero should be added as a ***place holder***.

12.5 + 23.7 34.5 + 27.43

```
  12.5
+ 23.7
------
  36.2
------
   1
```

```
  34.50
+ 27.43
-------
  61.93
-------
   1
```

The children should now be adding **more than two values**, carefully aligning place value columns.



This method should continue to be applied to money and measurement values.

Year 5 statutory requirements:

- ✓ Add whole numbers with more than 4 digits using formal written methods of columnar addition.
- ✓ Add numbers mentally, with increasingly large numbers.
- ✓ Solve addition multi-step problems in contexts, deciding which operations and methods to use and why.
- ✓ Solve problems involving numbers up to three decimal places.

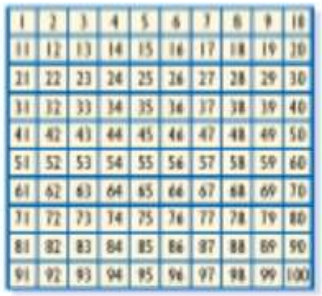
Year 6 statutory requirements:

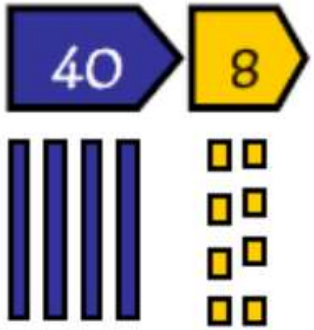
- ✓ Pupils are expected to solve more complex addition and subtraction problems.

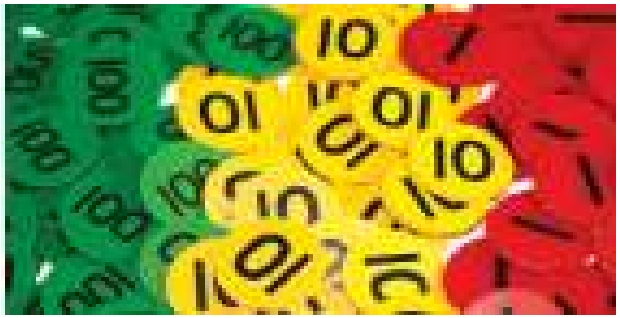
Concrete Resources Subtraction

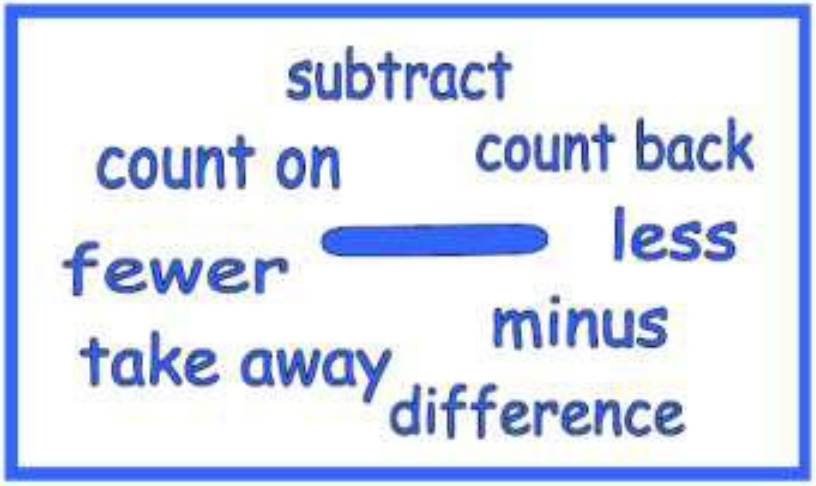
Examples of concrete resources that can be used for subtraction:

100 square
Number lines
Bead strings
Straws
Dienes
Counting stick
Place value dice
Place value cards
Place value counters
Cars/dinosaurs (anything that interests the child)





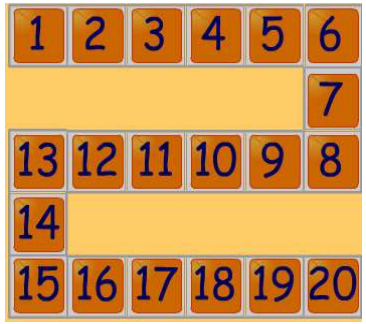




EYFS

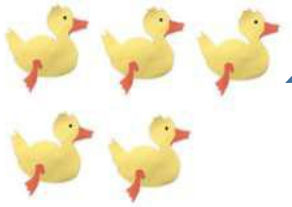
Subtraction

Say which number is one less than a given number using a number line or number track to 20.



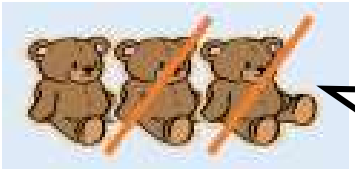
Begin to count backwards in familiar contexts such as number rhymes or stories.

10 green bottles sitting on the wall ...



5 little ducks went swimming one day...

Begin to relate subtraction to 'taking away' using concrete objects and role play.



Three teddies take away two teddies leaves one teddy

If I take away four shells there are six left

Count backwards along a number line to 'take away'

Early learning goals:

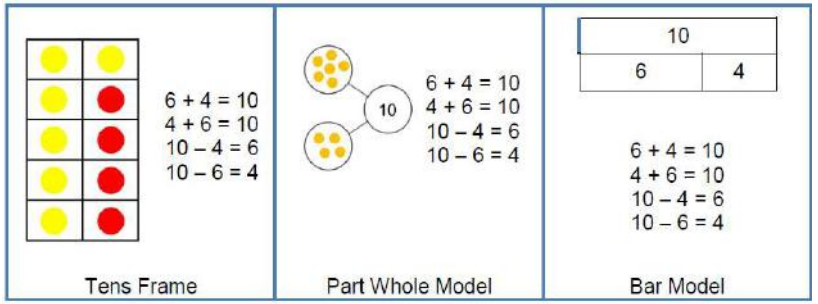
- ✓ Say which number is one less than a given number.
- ✓ Using quantities and objects, they subtract two single-digit numbers and count back to find the answer.

Year 1 Subtraction

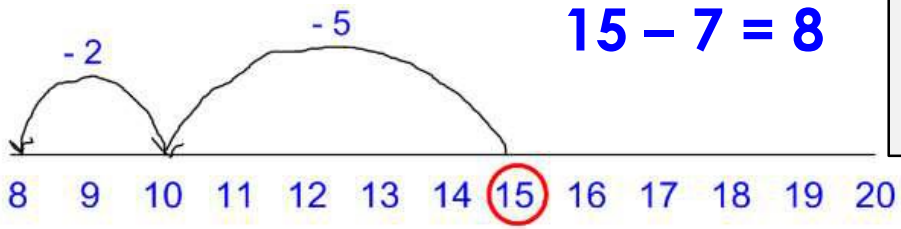
Use number bonds and related subtraction facts within 20.

16 – ☐ = 10

20 – ☐ = 15



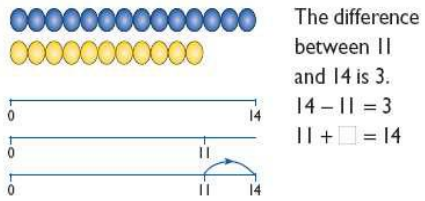
Use number line to support the subtraction of numbers. Know and use strategy of **counting back** to subtract one-digit and two-digit numbers to 20.



15 – 7 = 8

Begin to use the - and = signs to write calculations in a number sentence.

Counting on should only be used when the language used is 'find the difference', 'difference between' and 'distance between'.



Solve one-step problems using concrete objects and pictorial representations.

Dan has 12 football stickers.
He gives 4 to Ben.
How many stickers does he have left?

12 – 8 = 4

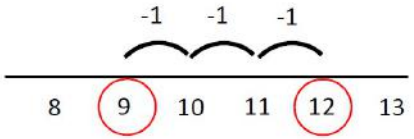
Year 1 statutory requirements:

- ✓ Say which number is one less than a given number.
- ✓ Represent and use number bonds and related subtraction facts within 20.
- ✓ Read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs.
- ✓ Subtract one-digit and two-digit numbers to 20, including zero.
- ✓ Solve one-step problems that involve subtraction using concrete objects and pictorial representations, and missing number problems.

Year 2 Subtraction

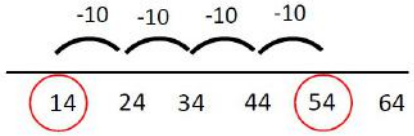
Subtract 2 digit and ones

12 – 3



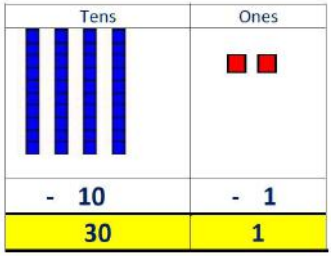
Subtract 2 digit and tens

54 – 40



Use expanded column method with place value resources to support the conceptual understanding of subtracting numbers with up to three digits ***with no exchanging.***

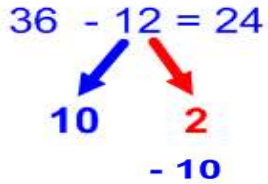
42 – 11 =

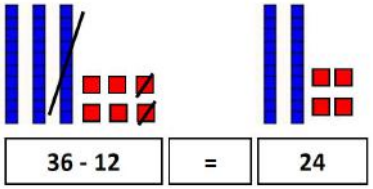


89 - 35 = 54

80 + 9
- 30 + 5
50 + 4

Use partitioning to subtract two 2-digit numbers using concrete resources and/or a numbered number line and then progressing to an empty number line.





49 - 16 =

49
− 16
33

When ready, move onto looking at the compact column subtraction method (see Year 3 for the steps).

Year 2 statutory requirements:

- ✓ Recall and use subtraction facts to 20 fluently, and derive and use related facts to 100.
- ✓ Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
- ✓ Subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers.

Year 3 Subtraction

Progress to using the expanded column method with place value resources to support the conceptual understanding of subtracting numbers with up to three digits ***with exchanging tens and/or hundreds***.

This method should then be extended to subtracting 3 digit numbers.

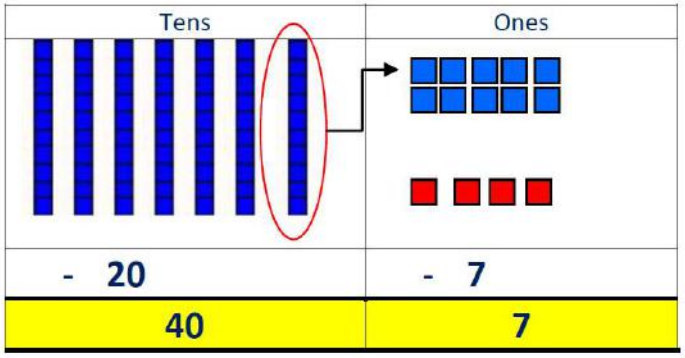
74 - 27 =

60 + 14

~~70~~ + ~~4~~

\- 20 + 7

40 + 7



In this example to subtract 7 ones from 4 ones we need to **exchange** a ten for ten ones. We now can subtract 7 ones from 14 ones.

537 – 254 = 283

400 + 130

~~500~~ + ~~30~~ + 7

\- 200 + 50 + 4

200 + 80 + 3

6 ~~7~~^{1}4

\- 2 7

4 7

Once the children have a secure understanding of exchanging, they should recognise that the number has been partitioned in a different way but that the value is the same e.g. 74 = 70 + 4 or 60 + 14. They can then progress onto applying this to the compact column subtraction.

4 ~~5~~^{1}~~3~~ 7

\- 2 5 4

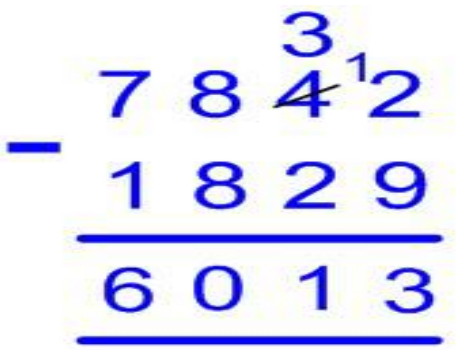
2 8 3

Year 3 statutory requirement:

- ✓ Find 10 or 100 less than a given number.
- ✓ Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).
- ✓ Subtract numbers with up to three digits, using formal written methods of column subtraction.
- ✓ Subtract numbers mentally, including:
  - A three-digit number and ones
  - A three-digit number and tens
  - A three-digit number and hundreds.

Year 4 Subtraction

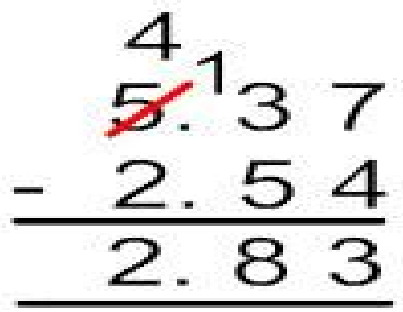
By the end of year 4, pupils should be subtracting numbers up to 4 digits using the compact column subtraction method.



Note: The exchanged ten or hundred is just as important as any other number, therefore, it should be written as clear and as large as any other number, and placed at the **top** of the column which has been adjusted.

Children should be given plenty of opportunity to apply this skill to subtracting money and measures.

£5.37 - £2.54 = £2.83



When subtracting decimals, it is essential that the decimal point does not move and is kept in line, including in the answer line. Where necessary, a zero should be added as a ***place holder.***

Year 4 statutory requirements:

- ✓ Find 1000 less than a given number.
- ✓ Subtract numbers with up to four digits, using formal written methods of columnar subtraction where appropriate.
- ✓ Solve subtraction two-step problems in contexts, deciding which operations and methods to use and why.

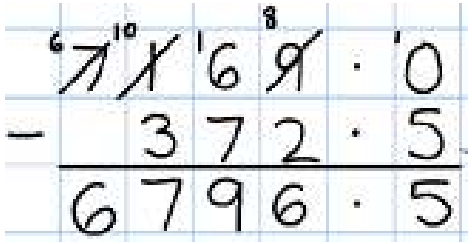
Year 5 and 6 Subtraction

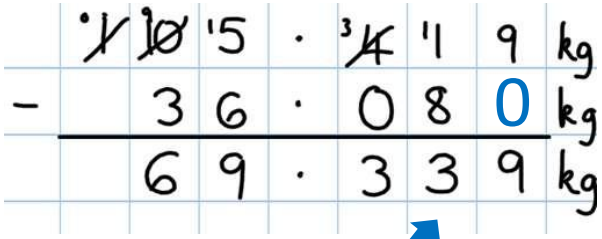
In year 5 and 6, pupils should be subtracting numbers larger numbers using the compact column subtraction method.

Opportunities should be given for the children to subtract mixtures of whole numbers and decimals, aligning the decimal point correctly.

Further opportunities should be provided to subtract and find differences between more complex decimal numbers in the context of money and measures.

$$\begin{array}{r} 8\ \ 7 \\ \cancel{9}\ {}^{1}6\ 7\ \cancel{8}\ {}^{1}3 \\ - \\ \hline 5\ 8\ 7\ 3\ 5 \\ \hline 3\ 8\ 0\ 4\ 8 \end{array}$$





Add a 'zero' in any empty decimal places to aid understanding of what to subtract in that column.

Year 5 statutory requirements:

- ✓ Subtract whole numbers with more than 4 digits using formal written methods of columnar subtraction.
- ✓ Subtract numbers mentally, with increasingly large numbers.
- ✓ Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- ✓ Solve problems involving numbers up to three decimal places.

Year 6 statutory requirements:

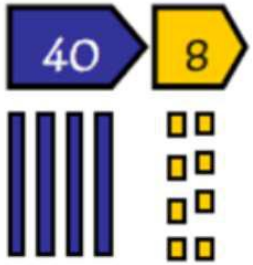
- ✓ Pupils are expected to solve more complex addition and subtraction problems

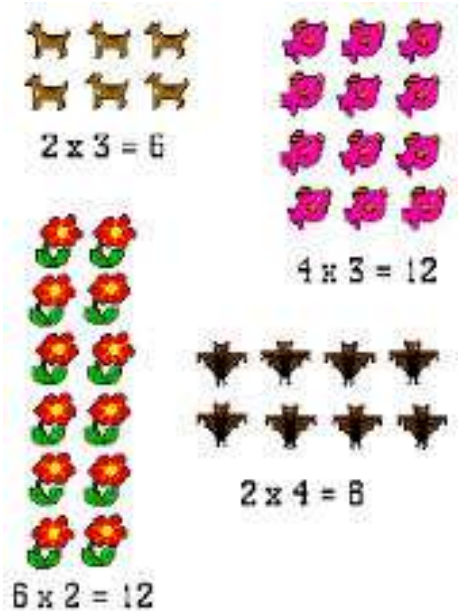
Concrete Resources Multiplication

Examples of concrete resources that can be used for multiplication:

Place value counters
Dienes
Place value charts
Arrays
Multiplication squares
100 square
Number lines
Blank number lines
Counting stick
Cars/dinosaurs (anything that interests the child)

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100



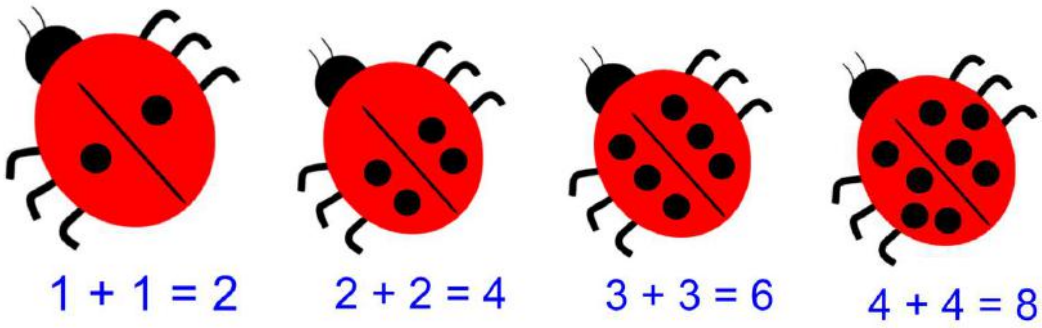


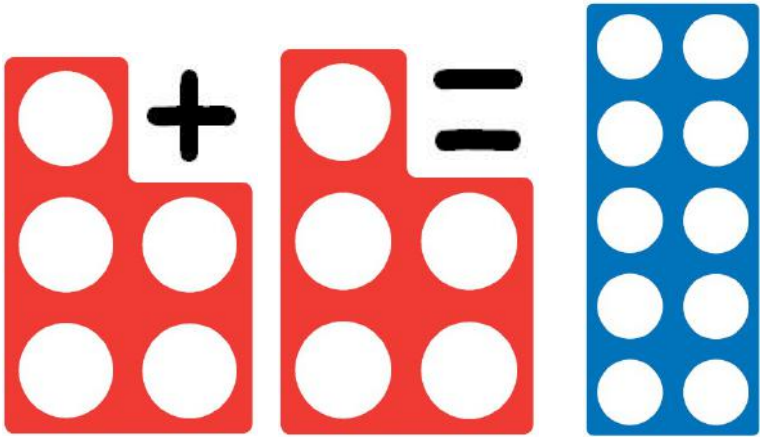
multiplication product
once, twice, three times
double groups of
repeated addition lots of
array, row, column multiply
times multiple

EYFS

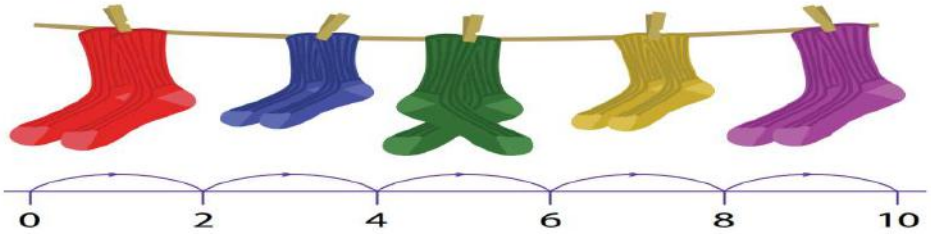
Multiplication

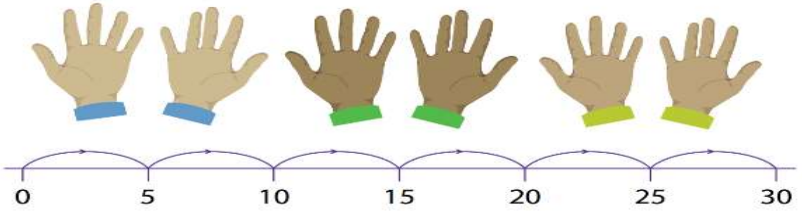
Use pictorial representations and concrete resources to double numbers to 10.





Use concrete resources, role play, stories and songs to begin counting in twos, fives and tens.





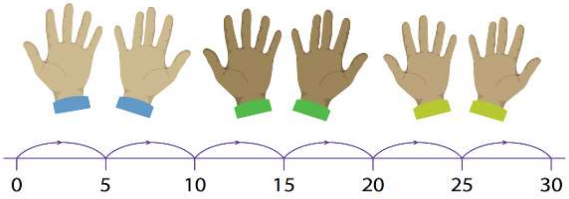
Early learning goal:

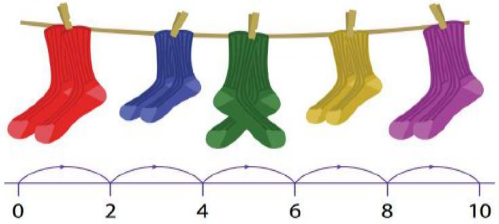
- ✓ They solve problems, including doubling, halving and sharing.

Year 1

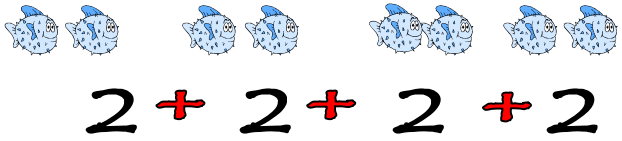
Multiplication

Count in twos, fives and tens using practical resources, role play, stories and songs.





Understand multiplication as repeated addition – use concrete objects to support understanding.



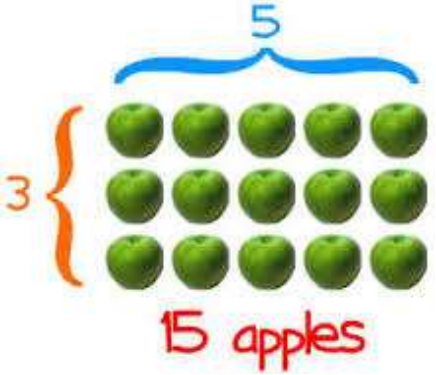
5 + 5 + 5
or
3 x 5

Use pictorial representations

3 x 5

3 groups of 5

Use arrays



Year 1 statutory requirement:

- ✓ Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Year 2 Multiplication

Further develop understanding multiplication as repeated addition.

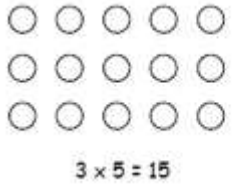
5 + 5 + 5
or
5 x 3

Use pictorial representations

3 x 5

3 groups of 5

Use arrays



5 x 3 = 15

3 x 5 = 15

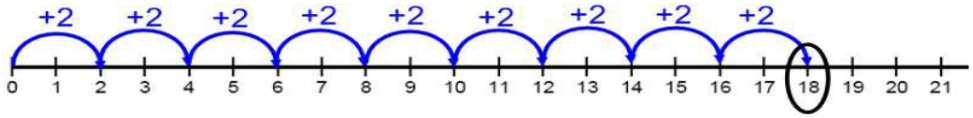
5 x 3 = 3 + 3 + 3 + 3 = 15

3 x 5 = 5 + 5 + 5 = 15

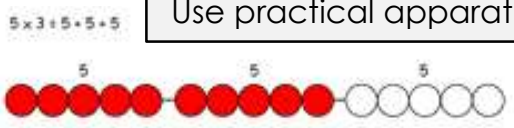
Use arrays to help teach the children about the commutative law of multiplication.

Model and bridge link from repeated addition to solving multiplication problems using a number line.

9 groups of 2 = 18
9 jumps of 2 = 18
9 x 2 = 18



Use practical apparatus



Year 2 statutory requirement:

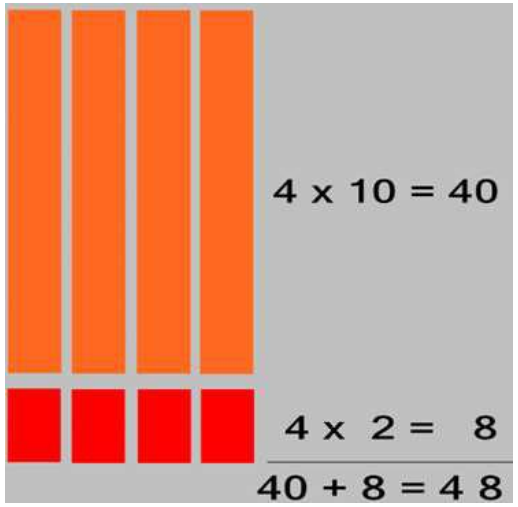
- ✓ Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
- ✓ Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs.
- ✓ Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.
- ✓ Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

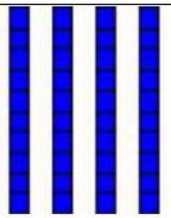
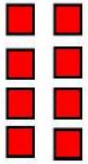
Year 3 Multiplication

Use concrete resources to develop conceptual understanding of the compact method introduced in Year 4.

The grid method can be introduced using concrete resources such as Dienes blocks or place value counters first to support understanding.

12 x 4 = 48



x	10	2
4		

x	10	2
4	40	8

$$\begin{array}{r} 10 + 2 \\ \times \quad 4 \\ \hline 8 \\ 40 \\ \hline 48 \end{array}$$

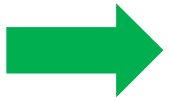
Year 3 statutory requirements:

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

Year 4 Multiplication

Build on learning from Year 3 and model how grid method and/or expanded method links to compact short multiplication.

x	30	6
4	10 10 10 10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



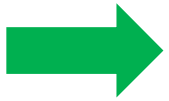
30 + 6
x 4
24
+ 120
144

36
x 4
144
2

In Year 4, the children should be multiplying 3-digit numbers by 1 digit numbers.

X	100	30	6
5	500	150	30

500
150
+ 30
680



1 3 6
x 5
6 8 0
1 3

Year 4 statutory requirement:

- ✓ Recall multiplication and division facts for multiplication tables up to 12 × 12
- ✓ Use place value, known and derived facts to multiply and divide mentally, including: multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
- ✓ Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

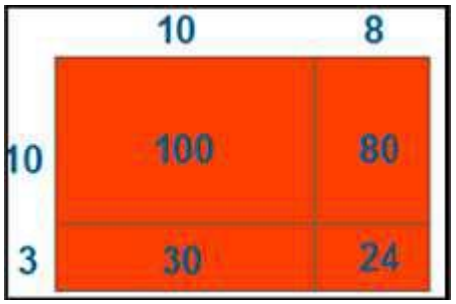
Year 5 Multiplication

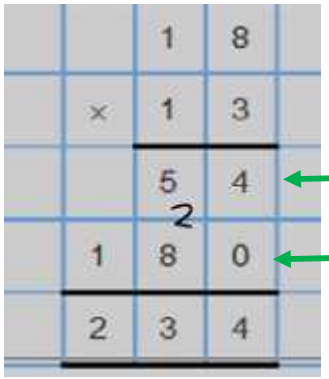
Build on learning from Year 4 and use concrete resources if needed to multiply numbers up to 4 digits by **one digit** using compact short multiplication.

643 x 8

643
× 8
5144
3 2

Reinforce the connection between the grid method to multiply numbers up to 4 digits by **two digit** using long multiplication.





18 x 3

18 x 10 (a zero goes into the ones column first as it is now multiplying by a tens number).

The grid method can be used to introduce long multiplication, as the relationship can be seen in the answers in each row.

To multiply by 10, 100 or 1000, children should use place value charts to show that the digit moves a column (s) to the left. The value of the digit is increasing by 10, 100 or 1000 times.

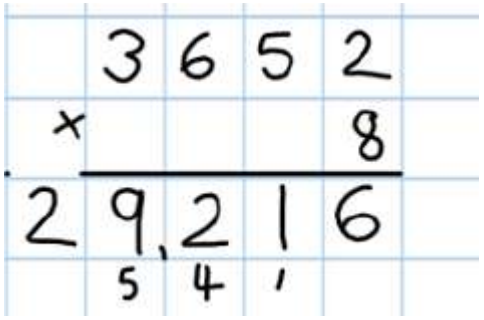
X 10

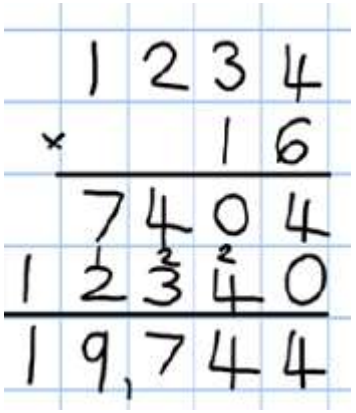
Year 5 statutory requirements:

- ✓ Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.
- ✓ Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.

Year 6 Multiplication

Build on learning from Year 5, multiplying numbers using compact short multiplication and long division.

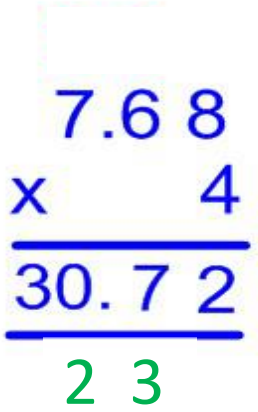




(1234 x 6)

(1234 x 10)

Use compact short multiplication to multiply decimal number by whole number.



Line up the decimal points in the question and the answer.

Apply this method to multiply money and other measures.

Year 6 statutory requirements:

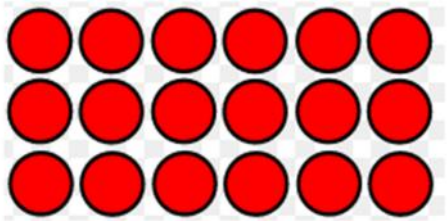
- ✓ Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- ✓ Multiply one-digit numbers with up to two decimal places by whole numbers.

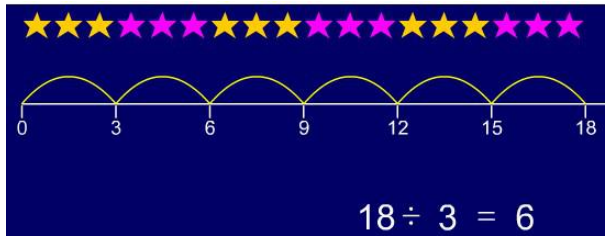
Concrete Resources

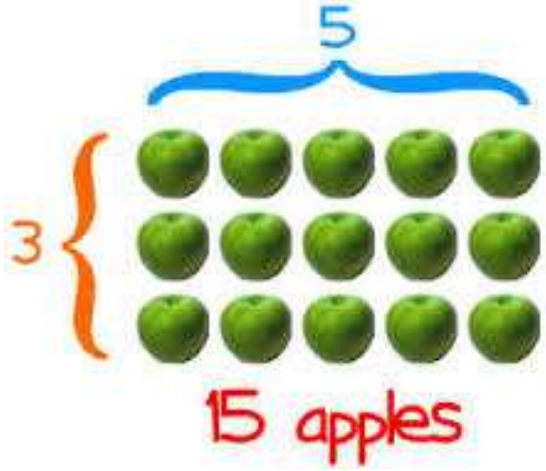
Division

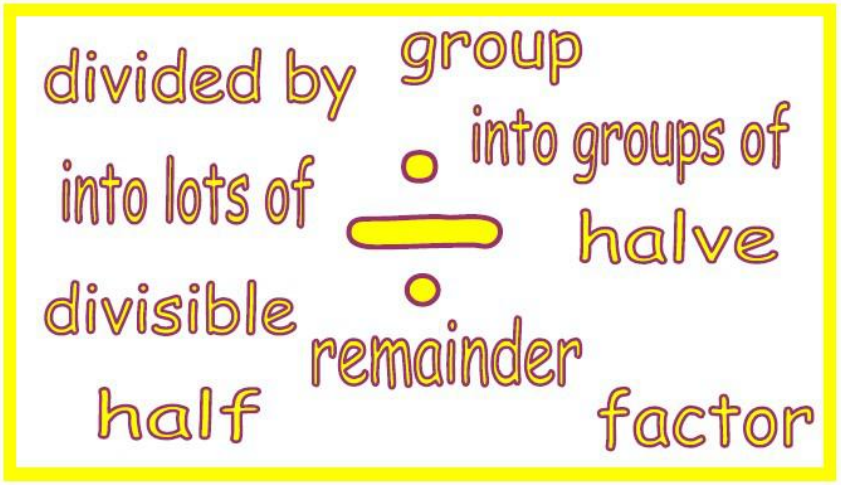
Examples of concrete resources that can be used to support division:

Arrays
Multiplication squares
100 square
Number lines
Blank number lines
Counting stick
Place value apparatus
Cars/dinosaurs (anything that interests the child)





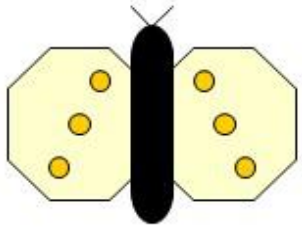


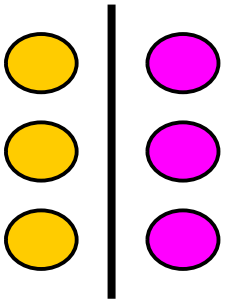


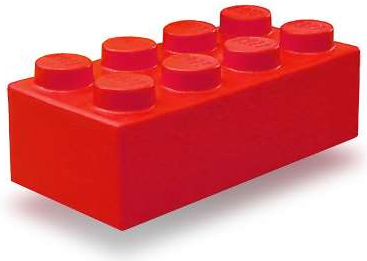
EYFS

Division

Use pictorial representations and concrete resources to halve numbers to 10.







Begin to share quantities using practical resources, role play, stories and songs.

Role play example:
It is the end of the party and the final two teddies are waiting for their party bags. Provide empty party bags and a small collection of items such as gifts, balloons and slices of cake. Ask the children to share the objects between the two bags.

Early learning goal:

- ✓ They solve problems, including halving and sharing.

Year 1

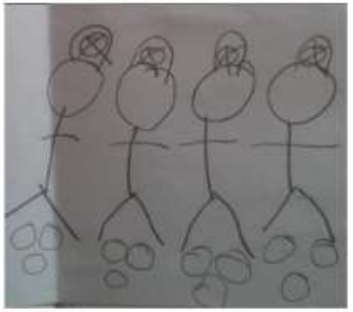
Division

Understand division as **sharing** using concrete resources before moving onto pictorial.

Pictorial representation of sharing **12 gold coins** between 2, 3 and 4 pirates!

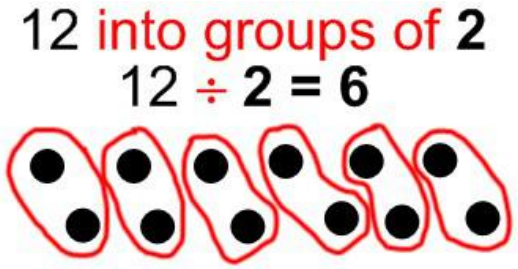
12 ÷ 2

12 ÷ 3



12 ÷ 4

Begin to understand division as **grouping** using concrete resources.



The children should have a clear understanding of the difference between **sharing** and **grouping**.

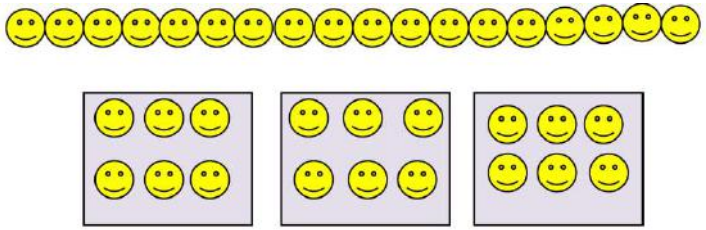
Year 1 statutory requirement:

- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

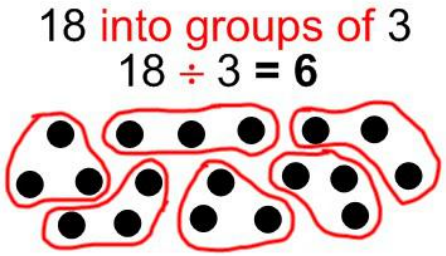
Year 2

Division

Further develop understanding of difference between **sharing and grouping** using concrete resources.



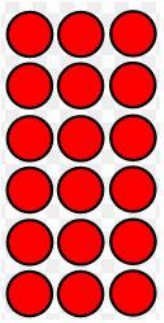
18 smiley faces shared between 3 classes.



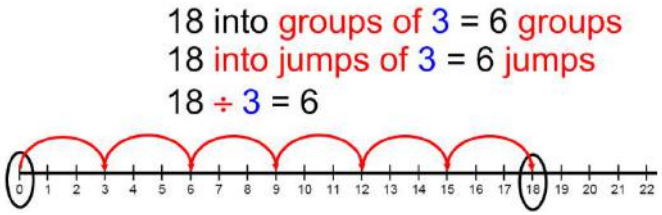
Reinforce division through the use of arrays.

18 ÷3 = 6

18 ÷6 = 3



Children use numbered number lines to divide using grouping.



Remember to develop connections between fractions and division and rephrase this calculation as 1/3 of 18 is the same as 18 ÷ 3 = 6.

Children could use a bead string of other practical apparatus before linking this to a number line.

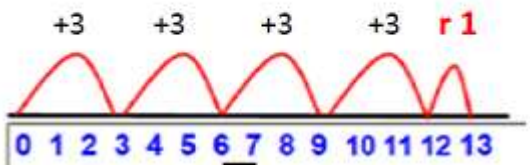
Year 2 statutory requirement:

- ✓ Recall and use division facts for 2, 5 and 10 multiplication tables.
- ✓ Calculate mathematical statements for multiplication and division within the multiplication tables and write then using the multiplication (x), division (÷) and equals (=) signs.
- ✓ Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
- ✓ ***Find 1/3; 1/4; 2/4; 3/4 of a length, shape, set of objects or quantity***

Year 3

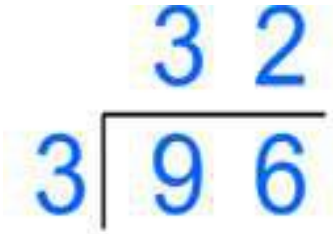
Division

13 ÷ 3 = 4 r 1



Continue to use grouping on a number line to divide but begin to introduce the children to 'remainders'.

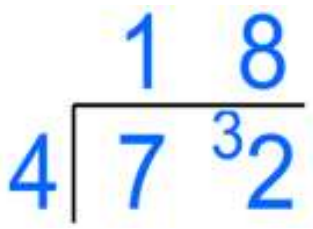
Use concrete apparatus to introduce 'remainders' first.



Once secure with grouping, introduce the concept of **short division**.

The numbers should be limited to **no** remainders in the answer **or** carried (each digit must be a multiple of the divisor).

Remind children of the correct place value (that 96 is equal to 90 and 6) but in short division, ask:
-How many 3s in 9? = 3 and record above the **9 tens.**
-How many 3s in 6? = 2 and record above the **6 ones**.



Once secure with the concept of short division and remainders, introduce short division which includes remainders within the calculation.

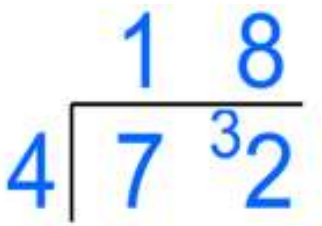
The children should be taught to 'carry' the remainder onto the next digit.
Remind the children that the remainder still represents 3 tens (in the example above) so the number becomes 32 ones.

The answer should still not include a remainder.

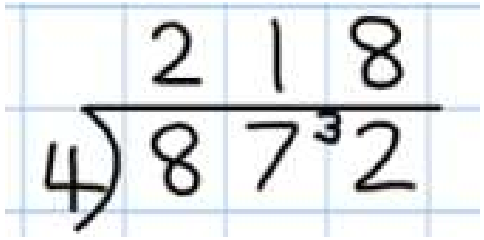
Year 3 statutory requirement:

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

Year 4 Division

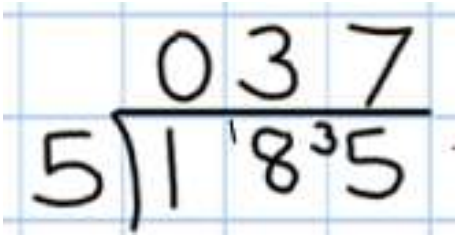


Children should secure dividing 2-digit numbers by a 1-digit number using short division, which includes remainders that are 'carried', before moving on.



Children should then move onto using short division to divide 3-digit numbers by a 1-digit number.

These problems should not result in a remainder in the answer.

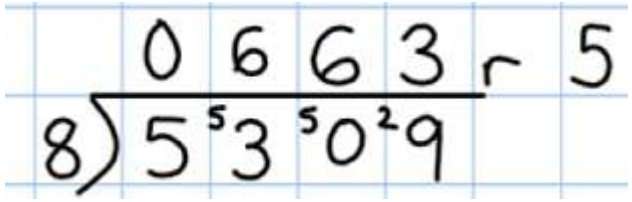


Children should then progress to dividing numbers where the first digit does not divide into the divisor. They should put a 0 above this digit to recognise this and then remember to 'carry' it as a remainder to the next digit.

Year 4 statutory requirement:
Note - there isn't a statutory objective for division. However, Y4 statutory multiplication objectives are to:
(1) recall multiplication and division facts for multiplication tables up to 12 × 12 and
(2) multiply two-digit and three-digit numbers by a one-digit number using formal written layout so we will build on the connections between multiplication and division.

Year 5

Division



Children should now be introduced to examples that include a remainder in the answer.

Children should consider the most appropriate way to express the remainder, based on the question.

$$\begin{array}{r} 27\text{ r }2 \\ 8\overline{)\,2^{2}1^{5}8} \end{array}$$

Ways to express remainders:

Whole number remainder = 27 r 2

Fraction remainder = $27\frac{2}{8} = 27\frac{1}{4}$

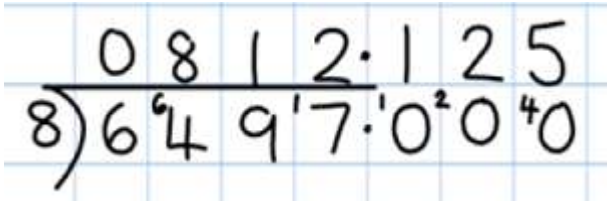
Decimal remainder = $27\frac{1}{4} = 27\frac{25}{100} = 27.25$

Year 5 statutory requirement:

- ✓ Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.

Year 6

Division



Children should now be introduced to finding exact decimal remainders.

Finding decimal remainders

In this example, rather than expressing the remainder as r1, a decimal point is added after the ones because there is still a remainder.

The 1 remainder is carried onto zeros after the decimal point (to show there was no decimal value in the original number).

Keep dividing to an appropriate degree of accuracy for the problem being solved.

Children should also be introduced to dividing by 2-digit numbers.

Using factors:

$$24 \overline{)588}$$

6 x 4 = 24 so dividing by 24 is the same as dividing by 6, then dividing by 4 or vice versa.

$$\begin{array}{r} 098 \\ 6\overline{)5^{5}8^{4}8} \end{array}$$

$$\begin{array}{r} 24.5 \\ 4\overline{)9^{1}8.^{2}0} \end{array}$$

If the number is prime, use long division:

$$\begin{array}{r} 27 \\ 36\overline{)\,972} \\ -\,720 \\ \hline 252 \\ -\,252 \\ \hline 0 \end{array}$$

20x

7x

Answer : 27

Find out 'How many 36s are in 972?' by subtracting 'chunks' of 36, until zero is reached (or until there is a remainder).

Children should write a 'useful list' first at the side that will help them decide what chunks to use e.g.

1x = 36
2x = 72
10x = 360

Year 6 statutory requirement:

- ✓ divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.