Maths Calculation Policy

Person responsible: Headteacher
Ratified by governing body: Summer 2021
Date for review: Spring 2024

Reverend Anne-Marie Renshaw
Chair of Governors

Maths calculation Policy

This policy supports the Hamilton Trust maths scheme used throughout the school.

Progression within each area of calculation is in line with the programme of study in the 2014 National Curriculum.

This calculation policy should be used to support children to develop a deep understanding of number and calculation. This policy has been designed to teach children through the use of concrete, pictorial and abstract representations.

By having a clear and consistent curriculum strategy throughout the school, teachers can ensure that children are hearing consistent language and using progressive methods that build from one year to the next. This policy shows the written calculation methods together with suggested Concrete, Pictorial & Abstract methods (CPA).

Concrete — a pupil is first introduced to an idea or skill by acting it out with real objects. This is a 'hands on' component using real objects and is a foundation for conceptual understanding.

Pictorial – a pupil can now relate the concrete to representations, such as a diagram or picture of the problem.

Abstract —a pupil is now capable of representing problems by using mathematical notation, for example 12 x 2 = 24.

Written Calculation methods Years 1-6

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Year 1

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Addition

Using place value

Count on in ones/counting in tens, *e.g. knowing 45 + 1 or 45 + 10 without counting on in ones.*

45 + ☐ = 50 65 + ☐ = 70

85 + ☐ = 90

Bead strings and 1-100 number grid help counting on/back in tens.

Counting on

Count on in ones, *e.g. 11 + 2 =* and *7 + 4 =*

Count on in tens, *e.g. 45 + 20 as 45, 55, 65*

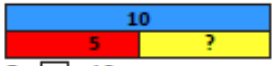
Using number facts

'Story' of 4, 5, 6, 7, 8 and 9, *e.g. 7 = 7 + 0 or 6 + 1 or 5 + 2 or 4 + 3.*

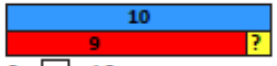
Number bonds to 10, *e.g. 5 + 5 , 6 + 4, 7 + 3, 8 + 2, 9 + 1, 10 + 0.*

6 + ☐ = 10

7 + ☐ = 10



5 + ☐ = 10



9 + ☐ = 10

Missing number sentences, 3 + [] = 7, link addition and subtraction.

Patterns using known facts, e.g. 4 + 3 = 7 so we know 24 + 3, 44 + 3, 74 + 3, etc.

- Subtraction

Using place value

Count back in 1s/Count back in 10s.

Say one less than any number to 100.

Say 10 less without counting back in ones.

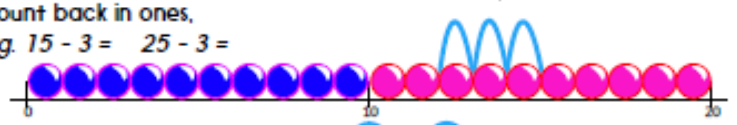
33 - 10 = 23

1	2	3	4	5
11	12	13	14	15
21	22	23	24	25
31	32		34	35
41	42	43	44	45

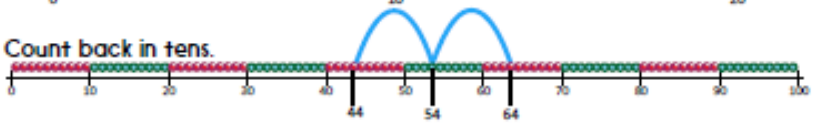
Subtracting by taking away

Count back in ones,

e.g. 15 - 3 = 25 - 3 =



Count back in tens.

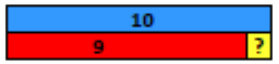


Using number facts

'Story' of 4, 5, 6, 7, 8 and 9, *e.g. 7 - 1 = 6, 7 - 2 = 5, 7 - 3 = 4, etc.*

Number bonds to 10, *e.g. 10 - 1 = 0, 10 - 2 = 8, 10 - 3 = 7, etc.*

10 - ☐ = 7



10 - ☐ = 9

Patterns using known facts, *e.g. 10 - 7 = 3 so we know 30 - 7 = ?*

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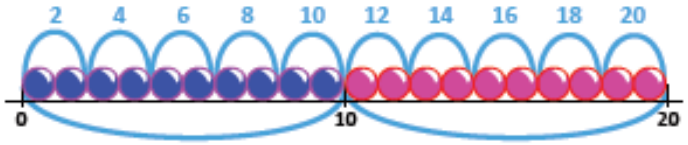
Year 1

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using x and two using ÷ which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that [] x 5 = 45 and 45 ÷ 5 = [] are seen as ways of expressing the same question.

x Multiplication

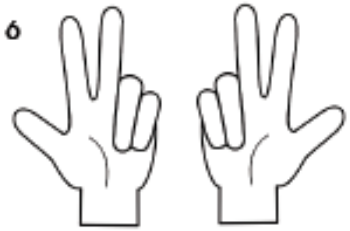
Counting in steps ('Clever' counting)

Count in 2s and 10s.



Doubling and halving

Find doubles to double 6 using fingers.



Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to '3 lots of 4' or '2 lots of 5', etc.

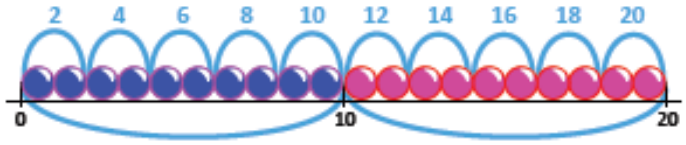
'Clever' counting is an excellent basis for multiplication and division.

Division must be presented as the inverse of multiplication (grouping).

÷ Division

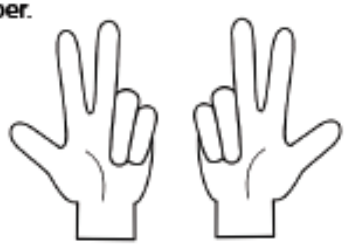
Couting in steps ('Clever' counting)

Count in 2s, and 10s.



Doubling and halving

Find half of even numbers up to 12 including realising that it is hard to halve an odd number.

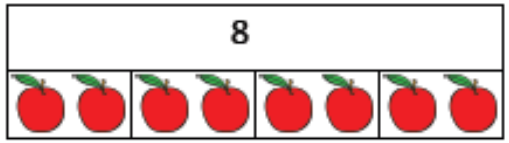


Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to *'how many towers of 3 can I make with 12 cubes?'*

Sharing

Begin to find half of a quantity using sharing, *e.g half of 16 cubes by giving one each repeatedly to two children.*



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Year 2

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Addition

Using place value

Know 1 more or 10 more than any number, e.g. 1 more than 67 or 10 more than 85.

Partitioning, e.g. 55 + 37 as 50 + 30 and 5 + 7 finally combining the two totals: 80 + 12.

50 + 30 = 80

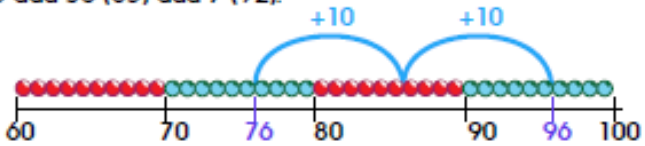
5 + 7 = 12

80 + 12 = 92

Bead strings and 1-100 number grid help counting on/back in tens.

Counting on

Add ten and mupltiples of ten, e.g. 76 + 20 as 76 , 86, 96 or in one hop 76 + 20. Add two 2-digit numbers by counting on in tens and then in ones, e.g. 55 + 37 as 55 add 30 (85) add 7 (92).



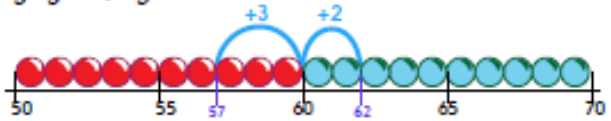
Add near multiples, e.g. 46 + 19 or 63 + 21.

Using number facts

Know pairs of numbers which make the numbers up to and including 10, e.g. *8 = 4&4, 3&5, 2&6, 1&7 and 10 = 5&5, 4&6, 3&7, 2&8, 1&9, 0&10.*

Patterns of known facts, e.g. *6 + 3 = 9, so we know 36 + 3 = 39, 66 + 3 = 69, 53 + 6 = 59.*

Bridging ten, e.g. *57 + 5 as 57 add 3 then add 2 more.*



Missing number sentences, 3 + [] = 7, link addition and subtraction.

Adding three or more single-digit numbers, spotting bonds to 10 or doubles, e.g. *6 + 7 + 4 + 2 as 10 + 7 + 2.*

- Subtraction

Using place value

Know 1 less or 10 less than any number, e.g. 1 less than 74 or 10 less than 82.

Partitioning, e.g. 55 - 32 as 50 - 30 and 5 - 2 combining the answers: 20 + 3.

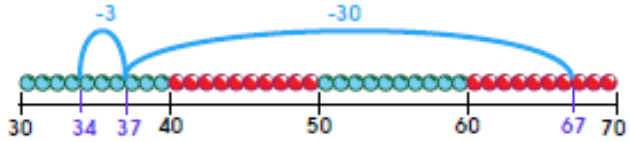
50 - 30 = 20

5 - 2 = 3

55 - 32 = 23

Taking away

Subtract ten and multiples of ten, e.g. *76 - 20 as 76, 66, 56 or in one hop 76 - 20 = 56.* Subtract two 2-digit numbers by counting back in tens then in ones, e.g. *67 - 33 as 67 subtract 30 (37) then count back 3 (34).*



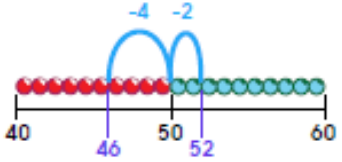
Subtracting near multiples, e.g. *74 - 21 or 57 - 19.*

Using number facts

Know pairs of numbers which make the numbers up to and including 10, e.g. *10 - 6 = 4, 8 - 3 = 5, 5 - 2 = 3, etc.*

Patterns of known facts, e.g. *9 - 6 = 3, so we know 39 - 6 = 33, 69 - 6 = 63, 89 - 6 = 83.*

Bridge ten, e.g. *52 - 6 as 52 subtract 2 then subtract 4 more.*



Counting up

Find a difference between two numbers on a line, e.g. *51 - 47.*

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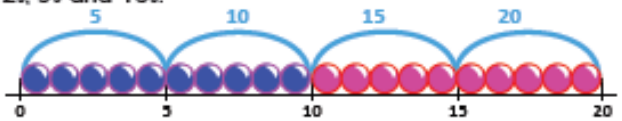
Year 2

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using x and two using ÷ which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that [] x 5 = 45 and 45 ÷ 5 = [] are seen as ways of expressing the same question.

x Multiplication

Counting in steps ('Clever' counting)

Count in 2s, 5s and 10s.



Begin to count in 3s.

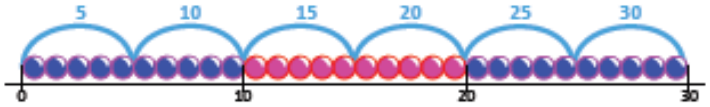
'Clever' counting is an excellent basis for multiplication and division.

Doubling and halving

Begin to know doubles of multiples of 5 to 100, *e.g. double 35 is 70.*

Grouping

Use arrays to find answers to multiplication and relate to 'clever' counting, *e.g. 3 x 4 as three lots of four things and 6 x 5 as six steps in the 5s count as well as six lots of five.*



Understand that 5 x 3 can be worked out as three 5s or five 3s.

Use number facts

Know doubles to double 20

Double 7 = 14

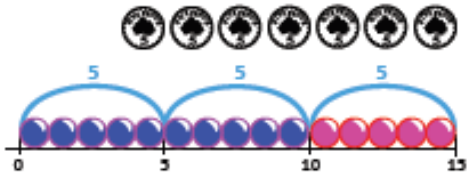
Division, grouping, is the inverse of multiplication.

Start learning 2x, 5x, 10x tables, relating these to 'Clever counting' in 2s, 5s, and 10s, *e.g. 5 x 10 = 50, and 10, 20, 30, 40, 50 is five steps in the tens count.*

÷ Division

Counting in steps ('Clever' counting)

Count in 2s, 5s and 10s



Doubling and halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a ½.

Begin to know half of multiples of 10 to 100, *e.g. half of 70 is 35.*

Grouping

Relate division to multiplication by using arrays of towers of cubes to find anwers to division, *e.g. how many towers of five cubes can I make from 20 cubes as ☐ x 5 = 20 and also as 20 ÷ 5 = ?*

Relate division to 'clever' counting and hence to multiplication, e.g. *how many 5s do I count to get to 20?*

Sharing

Begin to find half or a quarter of a quantity using sharing, e.g. ¼ of 16 cubes by sorting the subes into four piles.

Find ¼, ½, ¾ of small quantities.

Using number facts

Know halves of even numbers to 24.

Know 2x, 5x and 10x division facts.

Begin to know 3x division facts.

half of 20 is...

20	
?	?

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Year 3

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Addition

Using place value

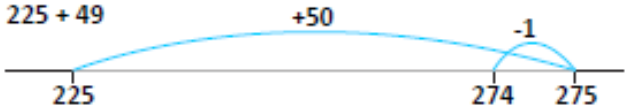
Count in hundreds, e.g. knowing 475 + 200 as 475, 575, 675.

Add multiples of 10, 100 and £1,
e.g. 746 + 200 or 746 + 40 or
£6.34 + £5 as £6 + £5 and 34p.

Partitioning, e.g. 68 + 74 as 60 + 70 and 8 + 4 and combine the totals: 130 + 12 = 142
Or £8.50 + £3.70 as £8 + £3 and 50p + 70p and combine: £11 + £1.20.

Counting on

Add 2-digit numbers by adding the multiple of ten then the ones, e.g. 67 + 55 as 67 add 50 (117) add 5 (122).
Add near multiples of 10 and 100, e.g. 67 + 39 or 364 + 199.



Count on from 3-digit nos, e.g. 247 + 34 as 247 + 30 (277) then 277 + 4 = 281.

Using number facts

Number bonds to 100, e.g. 35 + 65, 46 + 54, 73 + 27, etc.

100	
65	35

Add to next ten and next hundred, e.g. 176 + 4 = 180, 435 + 65 = 500, etc.

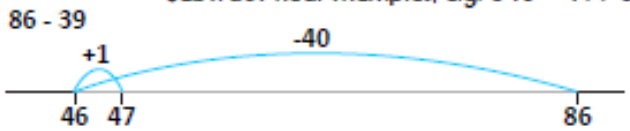
Subtraction is both taking away and - importantly - difference.

We no longer count in 1s but use PV and number facts.

- Subtraction

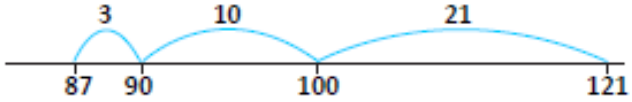
Taking away

Use place value to subtract, e.g. 358 – 300 or 348 – 40 or 348 – 8.
Taking away multiples of 10, 100 and £1, e.g. 476 – 40 = 436, 476 – 300 = 176, £4.76 - £2 = £2.76.
Partitioning, e.g. 68 – 42 as 60 – 40 and 8 – 2 or £6.84 - £2.40 as £6 - £2 and 80p – 40p.
Count back in hundreds, tens and then ones, e.g. 763 – 121 as 763 – 100 (663) then subtract 20 (643) then subtract 1 (642).
Subtract near multiples, e.g. 648 – 199 or 86 – 39.



Counting up

Find a difference between two numbers by counting up from the smaller to the larger, e.g. 121 – 87.



Using number facts

Number bonds to 100, e.g. 100 – 35 = 65, 100 – 48 = 52, etc.

100	
48	?

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Year 3

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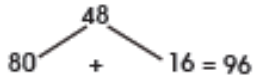
x Multiplication

Counting in steps ('Clever' counting)

Count in 2s, 3s, 4s, 5s, 8s and 10s, e.g. colour the multiples on a 1-100 grid or use hops along a landmarked line.

Doubling and halving

Find doubles to double 50 using partitioning.
Use doubling as a strategy in multiplying by 2,
e.g. 18 x 2 is double 18 (36).



Grouping

Recognise that multiplication is commutative, e.g. 4 x 8 = 8 x 4.
Multiply multiples of 10 by single-digit numbers, e.g. 30 x 8 = 240.
Multiply friendly 2-digit numbers by single-digit numbers, e.g. 13 x 4.

Using number facts

Know doubles to 20 and doubles of multiples of 5 to 100, e.g. double 45 is 90.
Know doubles of multiples of 5 to 100, e.g. double 85 is 170.
Know 2x, 3x, 4x, 5x, 8x, 10x tables facts.

Doubling and halving form the basis of mental x & ÷ strategies.

Number facts must be memorised and used on a daily basis.

x Written Multiplication

Build on partitioning to develop grid multiplication.

x	20	3	=
4	80	12	92

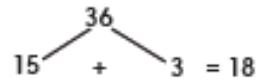
÷ Division

Counting in steps ('Clever' counting)

Count in 2s, 3s, 4s, 5s, 9s and 10s by colouring numbers on the 1-100 grid or using a landmarked line.

Doubling and halving

Find half of even numbers to 100 using partitioning.
Use halving as a strategy in dividing by 2,
e.g. 36 ÷ 2 is half of 36.



Grouping

Recognise that division is not commutative, e.g. 16 ÷ 8 does not equal 8 ÷ 16.
Relate division to multiplications 'with holes in', e.g. ☐ x 5 = 30 is the same calculation as 30 ÷ 5 = ? thus we can count in in 5s to find the answer.
Divide multiples of 10 by single-digit numbers, e.g. 240 ÷ 8 = 30.

Using number facts

Know halves of even numbers to 40.

28	
?	?

Know halves of multiples of 10 to 200, e.g. half of 170 is 85.
Know 2x, 3x, 4x, 5x, 8x, 10x division facts.
Use divison facts to find unit and simple non-unit fractions of amounts within the times tables, e.g. ¾ of 48 is 3 x (48 ÷ 4).

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Year 4

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Addition

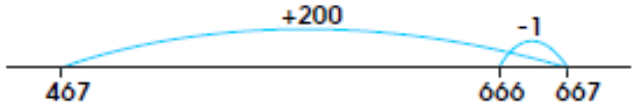
Using place value

Count in thousands, e.g. knowing 475 + 200 as 475, 575, 675.
Partitioning, e.g. 746 + 203 as 700 + 200 and 46 + 3
or 134 + 707 as 130 + 700 and 4 + 7.

PV and number facts are central to mental strategies.

Counting on

Add 2-digit numbers by adding the multiple of ten then the ones, e.g. 67 + 55 as 67 add 50 (117) add 5 (122).
Add near multiples of 10, 100 and 1000, e.g. 467 + 199 or 3462 + 2999.



Count on to add 3-digit numbers and money, e.g. 463 + 124 as 463 + 100 (563) + 20 (583) + 4 = 587 or £4.67 + £5.30 as £9.67 add 30p.

Using number facts

Number bonds to 100 and to next multiple of 100, e.g. 463 + 37, 1353 + 47.

Number bonds to £1 and to the next whole pound, e.g. £3.45 + 55p.
Add to the next whole number, e.g. 4.6 + 0.4 or 7.2 + 0.8.

Counting up is essential for money calculations and, later, decimals.

- Subtraction

Taking away

Use place value to subtract, e.g. 4748 - 4000 or 4748 - 8, etc.

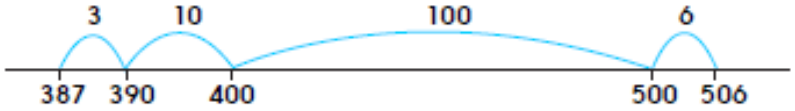
Take away multiples of 10, 100, 1000, £1, 10p or 0.1, e.g. 8392 - 50 or 6723 - 3000 or £3.74 - 30p or 5.6 - 0.2.

Partioning, e.g. £5.87 - £3.04 as £5 - £3 and 7p - 4p or 7493 - 2020 as 7000 - 2000 and 90 - 20.

Count back, e.g. 6482 - 1301 as 6482 - 1000, then - 300, then -1 (5181).
Subtract near multiples, e.g. 3522 - 1999 or £34.86 - £19.99.

Counting up

Find a difference between two numbers by counting up from the smaller to the larger, e.g. 506 - 387.



100 + 10 + 6 + 3 = 119

Using number facts

Number bonds to 10, 100 and derived facts, e.g. 100 - 76 = 24, 1.0 - 0.6 = 0.4.

100	
76	24

Number bonds to £1 and £10, e.g. £1.00 - 86p = 14p or £10 - £3.40 = £6.60.

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Year 4

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Written Addition

Build on expanded column addition to develop compact column addition with larger numbers.

	1000	400	60	8
+	4000	800	60	6
	1000	100	10	
	6000	300	30	4

Expanded methods firm up a robust understanding of place value.

Compact column addition with larger numbers.

```
  5347
  2286
+ 1495
  121
  9128
```

Use expanded and compact column addition to add amounts of money, e.g. £3.24 + £2.58.

£3	20p	4p	
£2	50p	8p	
£5	70p	12p	£5.82

	£3.24
+	£2.58
	1
	£5.82

Stress that decimals and fractions are parts of a whole.

Add like fractions, e.g. $\frac{3}{8} + \frac{1}{8} + \frac{1}{8}$.

- Written Subtraction

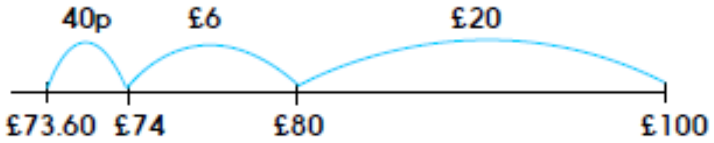
Expanded column subtraction.

	600	110	16
	~~700~~	~~20~~	~~6~~
-	300	50	8
	300	60	8

Begin to use column subtraction.

	6	11	16
	~~7~~	~~2~~	~~6~~
-	3	5	8
	3	6	8

Use counting up subtraction to find change from £10, £20, £50 and £100, e.g. £100 - £73.60.



£20 + £6 + 40p = £26.40

Subtract like fractions, e.g. $\frac{3}{8} - \frac{1}{8} = \frac{2}{8}$.

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Year 4

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using x and two using ÷ which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that [] x 5 = 45 and 45 ÷ 5 = [] are seen as ways of expressing the same question.

x Multiplication

Counting in steps (sequences)
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s.

Doubling and halving
Find doubles to double 100 and beyond using partitioning, e.g. double 226.

226
400 + 40 + 12 = 452

Facility in doubling and halving is key for mental x and ÷ strategies.

Begin to double amounts of money, e.g. £3.50 doubled is £7.
Use doubling as a strategy in multiplying by 2, 4 and 8, e.g. 34 x 4 = double 34 (68) doubled again (136).

Grouping
Use partitioning to multiply 2-digit numbers by single-digit numbers.
Multiply multiples of 100 by single-digit numbers using tables facts, e.g. 400 x 8 = 3200.
Multiply using near multiples by rounding, e.g. 24 x 19 as (24 x 20) - 24.

Using number facts
Know times tables up to 12 x 12.

Stress that division is multiplication with 'holes' in.

÷ Division

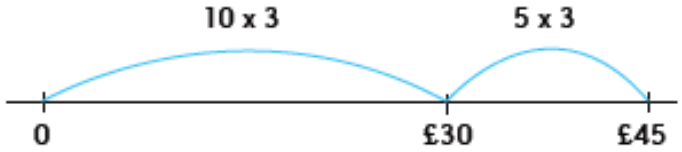
Counting in steps (sequences)
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s.

Doubling and halving
Find halves of even numbers to 200 and beyond using partitioning.

344	
172	172

Begin to half amounts of money, e.g. £9 halved is £4.50.
Use halving as a strategy in dividing by 2, 4 and 8, e.g. 164 ÷ 4 is half of 164 (82) halved again (41).

Grouping
Use multiples of 10 times the divisor to divide by numbers <9 above the tables facts, e.g. 45 ÷ 3.



Divide multiples of 100 by single-digit numbers using division facts, e.g. 3200 ÷ 8 = 4000.

Using number facts
Know times tables up to 12 x 12 and all related division facts.
Use division facts to find unit and non-unit fractions of amounts within the times tables, e.g. ⅞ of 56 is 7 x (56 ÷ 8).

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Year 4

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x Written Multiplication

Use grid multiplication to multipy 3-digit by 1-digit numbers.

x	200	50	3
6	1200	300	18

= 1518

If children understand place value they can develop fluency.

Use a vertical written algorithm (ladder) to multiply 3-digit numbers by 1-digit numbers.

```
  253
x   6
 1200
  300
   18
 1518
```

÷ Written Division

Written version of a mental method:

□ x 3 = 86

20 x 3 = 60

26

8 x 3 = 24

2

86 ÷ 3 = 28 r 2

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Year 5

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

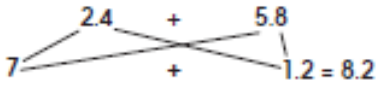
+ Addition

Using place value

Count in 0.1s, 0.01s, e.g. knowing what 0.1 more than 0.51 is.

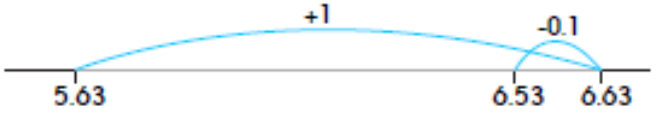
Partitioning, e.g. 2.4 + 5.8 as 2 + 5 and 0.4 + 0.8 and combine the totals: 7 + 1.2 = 8.2.

Subtracting by counting up is much less error prone.



Counting on

Add two decimal numbers by adding the ones then the tenths/hundredths, e.g. 5.72 + 3.05 as 5.72 add 3 (8.72) then add 0.05 (8.77).
Add near multiples of 1, e.g. 6.34 + 0.99 or 5.63 + 0.9.



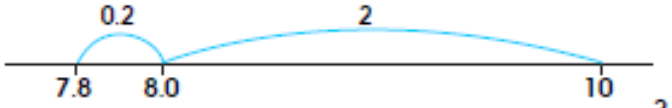
Count on from large numbers, e.g. 6834 + 3005 as 9834 + 5.

Using number facts

Number bonds to 1 and to the next whole number, e.g. 0.4 + 0.6 or 5.7 + 0.3.

Add to the next ten from a decimal number, e.g. 7.8 + 2.2 = 10.

Knowledge of number bonds underpins mental stratgegies.



2 + 0.2 = 2.2

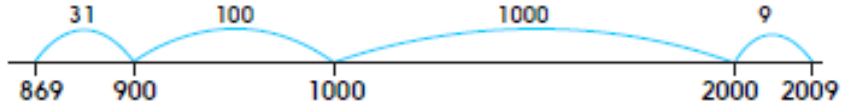
- Subtraction

Taking away

Using place value to subtract decimals, e.g. 4.58 - 0.08 or 6.26 - 0.2, etc.
Take away multiples of powers of 10, e.g. 15, 672 - 300 or 4.82 - 2 or 2.71 - 0.5 or 4.68 - 0.02.
Partition or count back, e.g. 3964 – 1051 or 5.72 – 2.01.
Subtract near multiples, e.g. 86,456 – 9999 or 3.58 – 1.99.

Counting up

Find a difference between two numbers by counting up from the smaller to the larger, e.g. 2009 - 869.



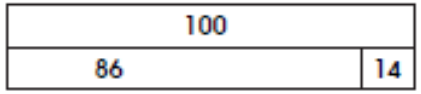
1000 + 100 + 31 + 9 = 1140

Find change using shopkeepers' addition, e.g. buy toy for £6.89 using £10.

£3 + 11p = £3.11

Using number facts

Derived facts from number bonds to 10 and 100, e.g. 2 – 0.45 using 45 + 55 = or 100 or 3.00 – 0.86 using 86 + 14 = 100.



Number bonds to £1, £10 and £100, e.g. £4.00 - £3.86p = 14p or £100 - £66 using 66 + 34 = £100.

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Year 5

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Written Addition

Expanded column addition for money leading to compact column addition for adding several amounts of money.

	£14	60p	4p	
	£28	70p	8p	
+	£12	20p	6p	
	£1	10p		
	£55	60p	8p	£55.68

Expanded version first embeds understanding of place value.

Compact column addition to add pairs of 5-digit numbers.

Continue to use column addition to add towers of several larger numbers.

Use compact addition to add decimal numbers with up to two places.

	15.68
+	27.86
	11.1
	43.54

Adding fractions with related denominators, e.g. ¼ + ⅜ = ⅝.

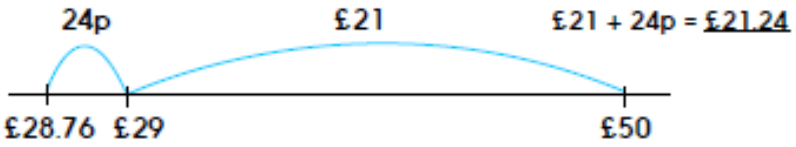
Equivalent fractions are the basis for + and - fractions.

- Written Subtraction

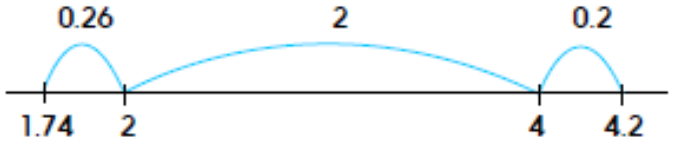
Compact column subtraction for numbers with up to 5 digits, e.g. 16,324 - 8516.

	0	15	13	1	14
-	~~1~~	~~6~~	~~3~~	~~2~~	~~4~~
	8	5	1	6	
	7	8	0	8	

Continue to use counting up subtraction for subtractions involving money, including finding change or, e.g. £50 - £28.76.



Use counting up subtraction to subtract decimal numbers, e.g. 4.2 – 1.74.



2 + 0.26 + 0.2 = 2.46

Subtracting fractions with related denominators, e.g. 1¼ - ⅜ as 1⅛ - ⅜ or ⅞ - ⅜ = ⅝.

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Year 5

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using x and two using ÷ which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that [] x 5 = 45 and 45 ÷ 5 = [] are seen as ways of expressing the same question.

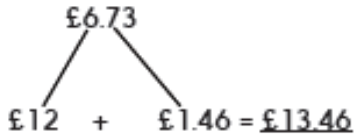
x Multiplication

Doubling and halving

Double amounts of money using partitioning, e.g. £6.73 doubled is double £6 (£12) plus double 73p (£1.46).

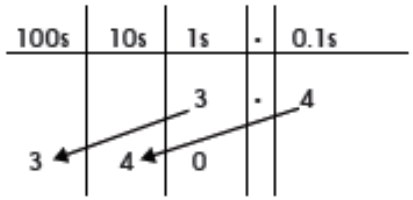
Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20, e.g. 58 x 5 = ½ of 58 (29) x 10 (290).

Partitioning remains a key skill throughout.



Grouping

Multiply decimals by 10, 100, 1000, e.g. 3.4 x 100 = 340.



Use partitioning to multiply friendly 2-digit and 3-digit numbers by single-digit numbers, e.g. 402 x 6 as 400 x 6 (2400) and 2 x 6 (12).

Use partitioning to multiply decimal numbers by single-digit numbers, e.g. 4.5 x 3 (4 x 3) + (4 x 0.5).

Multiply using near multiples by rounding, e.g. 32 x 29 as (32 x 30) – 32.

Learning times tables involves BOTH multiplication and division facts.

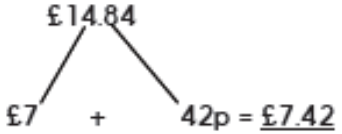
Using number facts

Use times tables facts up to 12 x 12 to multiply multiples of the multiplier, e.g. 4 x 6 = 24 so 4 x 6 = 240 and 400 x 6 = 2400.
Know square numbers and cube numbers.

÷ Division

Doubling and halving

Halve amounts of money using partitioning, e.g. half of £14.84 as half of £14 and half of 84p.



Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20, e.g. 115 ÷ 5 as double 115 (230) ÷ 10.

Grouping

Divide numbers by 10, 100, 1000 to obtain decimal answers with up to three places, e.g. 340 ÷ 100 = 3.4.

Use the 10th, 20th, 30th ... multiple of the divisor to divide friendly 2-digit and 3-digit numbers by single-digit numbers, e.g. 186 ÷ 6 as 30 x 6 (180) and 1 x 6 (6).

Find unit and non-unit fractions of large amounts, e.g. ⅜ of 265 is 3 x (265 ÷ 5).

Using number facts

Use division facts from the times tables up to 12 x 12 to divide mutiples of powers of ten of the divisor, e.g. 3600 ÷ 9 using 36 ÷ 9.

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Year 5

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using x and two using ÷ which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that [] x 5 = 45 and 45 ÷ 5 = [] are seen as ways of expressing the same question.

x Written Multiplication

Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers.

$$\begin{array}{r} 387 \\ \times \quad 6 \\ \hline 2322 \\ \hline \end{array}$$

Long multiplication of 2-digit, 3-digit and 4-digit numbers by teen numbers.

$$\begin{array}{r} 387 \\ \times \quad 14 \\ \hline 3870 \\ 1548 \\ \hline 5418 \\ \hline \end{array}$$

Grid multiplication of numbers with up to 2 decimal places by single-digit numbers.

£8.65 x 7

	£8	60p	5p	
x7	£56	£4.20	35p	£60.55

NB: Grid multiplication provides a default method for ALL children.

Multiplying fractions by single-digit numbers, e.g. ¾ x 6 = 18/4 which is 4 ¾ = 4 ½.

The closer division is linked to multiplication the better.

Visual images are essential to multiplying and dividing fractions.

÷ Written Division

Written version of a mental strategy for 3-digit ÷ 1-digit numbers.

□ x 6 = 326
50 x 6 = 300
26
4 x 6 = 24
2

54 r 2

326 ÷ 6 = 54 r 2

Short divison of 3-digit and 4-digit numbers by single-digit numbers.

$$\begin{array}{r} 1264 \\ 6\overline{)7^{1}5^{3}8^{2}4} \end{array}$$

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Year 6

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Addition

Using place value

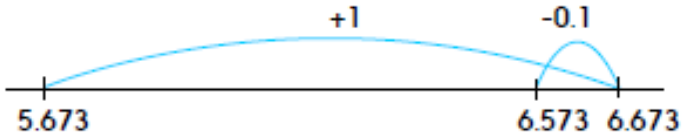
Count in 0.1s, 0.01s, 0.001s, e.g. knowing what 0.001 more than 6.725 is.
Partitioning, e.g. 9.54 + 3.25 as 9 + 3 and 0.5 + 0.2 and 0.04 + 0.05 to get 12.79.

10s	1s	·	0.1s ⅒s	0.01s ⅑₀s
	9	·	5	4
	3	·	2	5
1	2	·	7	9

Subtracting by counting up is much less error prone.

Counting on

Add two decimal numbers by adding the ones then the tenths/hundredths or thousandths, e.g. 6.314 + 3.006 as 6.314 add 3 (9.314) then add 0.006 (9.32).
Add near multiples of 1, e.g. 6.345 + 0.999 or 5.673 + 0.9.



Count on from large numbers, e.g. 16,375 + 12,003.

Using number facts

Number bonds to 1 and to the next multiple of 1, e.g. 0.63 + 0.37 or 2.355 + 0.645.
Add to next ten, e.g. 4.62 + 0.38.

5	
4.62	?

Knowledge of number bonds underppins mental strategies.

- Subtraction

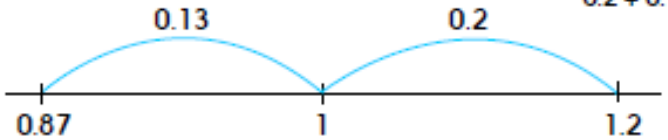
Taking away

Use place value to subtract decimals, e.g. 7.782 - 0.08 or 16.263 - 0.2, etc.
Take away multiples of powers of 10, e.g. 132,956 - 400 or 686,109 - 40,000 or 7.823 - 0.5.
Parition or count back, e.g. 3964 - 1051 or 5.72 - 2.01.
Subtract near multiples, e.g. 360,078 - 99,998 or 12.831 - 0.99.

Counting up

Count up to subtract numbers from multiples of 10, 100, 1000, 10,000
Find a difference between two decimal numbers by counting up from the smaller to the larger, e.g. 1.2 - 0.87.

0.2 + 0.13 = 0.33



Using number facts

Derived facts from number bonds to 10 and 100, e.g. 0.1 - 0.075 using 75 + 25 = 100 or 5 - 0.65 using 65 + 35 = 100.

Number bonds to £1, £10 and £100, e.g. £7.00 - £4.37 or £100 - £66.20 using 20p + 80p = £1 and £67 + £33 = £100.

£100	
£67	£33

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Year 6

Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that 6 + [] = 10 and 10 - 6 = [] are seen as ways of expressing the same question.

+ Written Addition

Compact column addition for adding several large numbers and decimals with up to two places.

Compact column addition with money.

Children must be able to do expanded as well as compact to show understanding.

£14.64	£14	60p	4p	
£28.78	£28	70p	8p	
+ £12.26	+ £12	20p	6p	
11.1	£1	10p		
£55.68	£55	60p	8p	£55.68

Adding fractions with unlike denominators,

e.g. $\frac{3}{4} + \frac{1}{3} = 1\frac{1}{12}$ or $2\frac{1}{4} + 1\frac{1}{3} = 3\frac{7}{12}$

$\frac{3}{4} + \frac{1}{3}$

$= \frac{9}{12} + \frac{4}{12}$

$= \frac{13}{12}$

$= 1\frac{1}{12}$

Understanding equivalent fractions is absolutely key here.

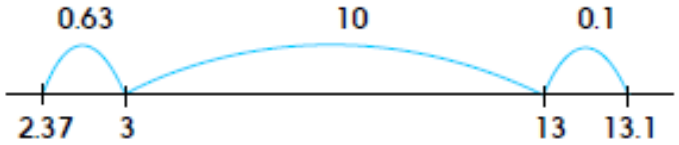
- Written Subtraction

Compact column subtraction for large numbers.

	2	14	7	15
-	~~3~~	~~4~~	~~8~~	~~5~~
	1	6	4	5	8
	1	8	2	2	7

Use counting up subtraction when dealing with money,
e.g. £100 – £78.56 or £45.23 - £27.57.

Use counting up subtraction to subtract decimal numbers,
e.g. 13.1 – 2.37.



10 + 0.63 + 0.1 = 10.73

Subtracting fractions with unlike denominators,

e.g. $1\frac{1}{4} - \frac{2}{3}$

$= \frac{5}{4} - \frac{2}{3}$

$= \frac{15}{12} - \frac{8}{12}$

$= \frac{7}{12}$

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Year 6

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using x and two using ÷ which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that [] x 5 = 45 and 45 ÷ 5 = [] are seen as ways of expressing the same question.

x Multiplication

Doubling and halving

Double decimal numbers with up to 2-places using partitioning, e.g. 36.73 doubled is double 36 (72) plus double 0.73 (1.46).

36.73

72 + 1.46 = 73.46

Understanding how to partition numbers underpins many calculation strategies.

Use doubling and halving as strategies in mental multiplication.

Grouping

Use partioning as a strategy in mental multiplication, as appropriate, e.g. 3060 x 4 as (3000 x 4) + (60 x 4) or 8.4 x 8 as 8 x 8 (64) and 0.4 x 8 (3.2)

Use factors in mental multiplication,
e.g. 421 x 6 as 421 x 3 (1263) doubled (2526)
or 3.42 x 5 as half of 3.42 x 10.

Mutliply decimal numbers using near multiples by rounding,
e.g. 4.3 x 19 as 4.3 x 20 (86 – 4.3).

Division as grouping, i.e. the inverse of multiplication, is a key concept.

Using number facts

Use times tables facts up to 12 x 12 in mental multiplication of large numbers or numbers with up to two decimal places,
e.g. 6 x 4 = 24 and 0.06 x 4 = 0.24.

÷ Division

Doubling and halving

Halve decimal numbers with up to 2-places using partitioning,
e.g. half of 36.86 if half of 36 (18) plus half of 0.86 (0.43).

36.86

18 + 0.43 = 18.43

Use doubling and halving as strategies in mental division,
e.g. 216 ÷ 4 is half of 216 (108) and half of 108 (54).

Grouping

Use 10th, 20th, 30th, ... or 100th, 200th, 300th ... multiples of the divisor to divide large numbers, e.g. 378 ÷ 9 as 40 x 9 = 360 and 2 x 9 = 18 so, the answer is 42.
Use test for divisibility, e.g. 135 divides by 3 as 1 + 3 + 5 = 9 and 9 is in the 3x table.

□ x 9 = 378
40 x 9 = 360
18
2 x 9 = 18
0
42

Using number facts

Use division facts from the times tables up to 12 x 12 to divide decimal numbers by single-digit numbers, e.g. 1.17 ÷ 3 is 1/100 of 117 ÷ 3 (0.39).

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Year 6

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x Written Multiplication

Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers.

```
  3875
x    6
 543
-----
23250
```

Short versions of multiplication and division are more important and useful than the long versions.

Long multiplication of 2-digit, 3-digit and 4-digit numbers by 2-digit numbers.

```
  258
x  16
----
2580
 258
----
4128
```

Short multiplication of decimal numbers using x 100 and ÷100, e.g. 13.72 x 6 as 1372 x 6 ÷100.

Short multiplication of money, e.g. £13.72 x 6 or £23.67 x 3.

```
 £23.67
x     3
  122
-----
£71.01
```

Grid multiplication of numbers with up to 2 decimal places by single-digit numbers.

NB: Grid multiplication provides a default method for ALL children.

Multiplying proper and improper fractions, e.g. ¾ x ⅔.

x	300	40	5	
20	6000	800	100	6900
6	1800	240	30	2070
				8970

÷ Written Division

Short division of 3-digit and 4-digit numbers by single-digit numbers.

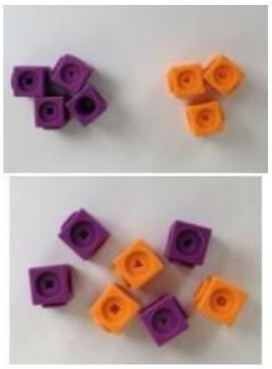
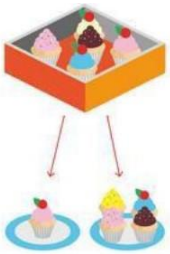
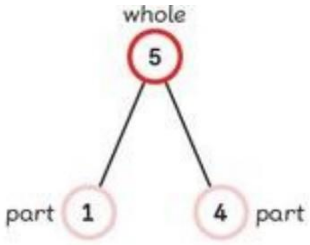
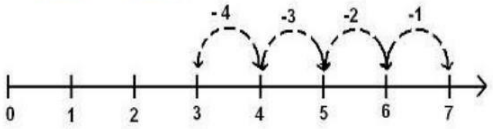
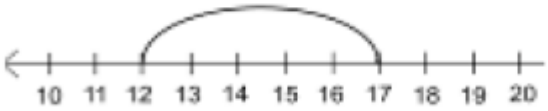
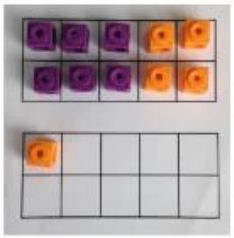
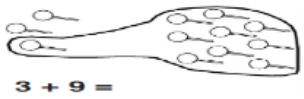
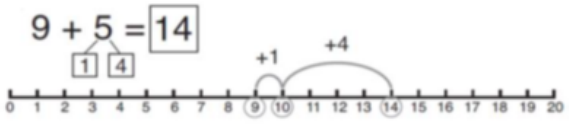
```
   1264
6 | 7 5 8 4
```

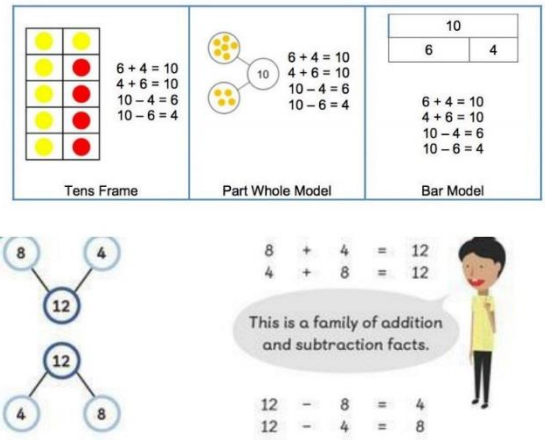
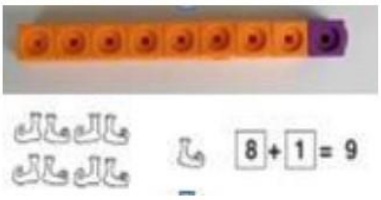
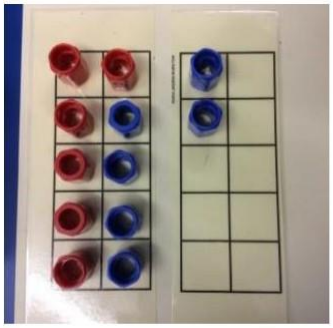
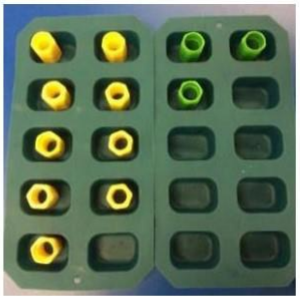
Long division of 3-digit and 4-digit numbers by two-digit numbers.

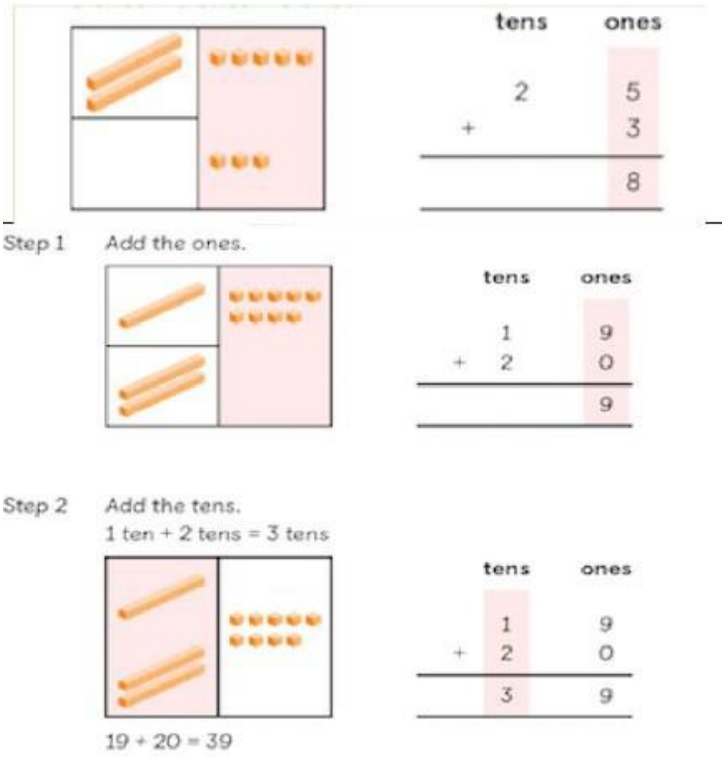
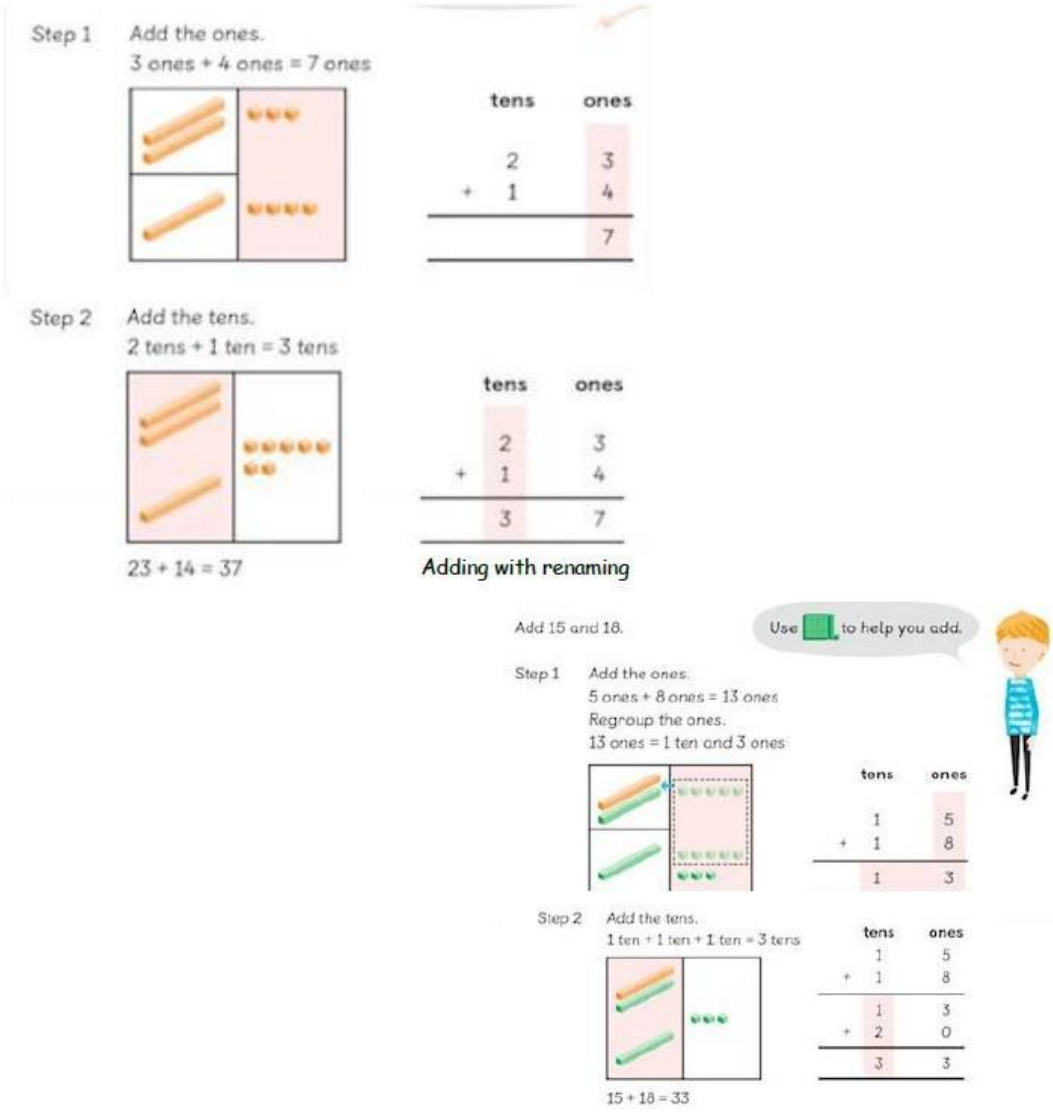
```
      200+50+1 | 15
15 | 3765      | 30
     3000      | 45
      765      | 60
      750      | 75
       15      | 90
```

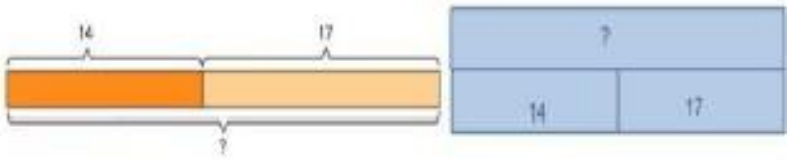
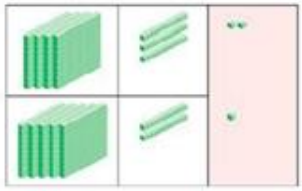
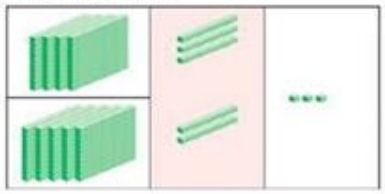
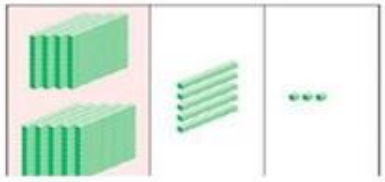
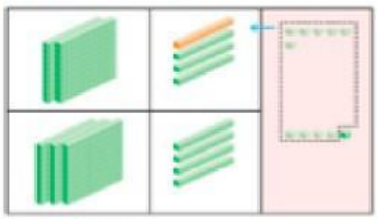
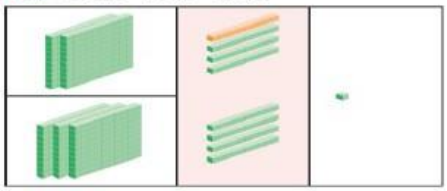
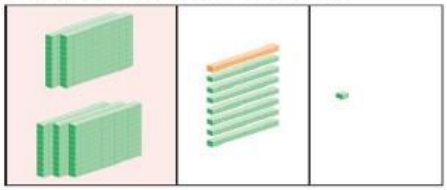
Divide fractions by whole numbers, e.g. ¼ ÷ 3 = 1/12.

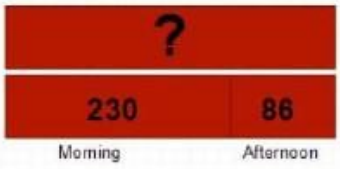
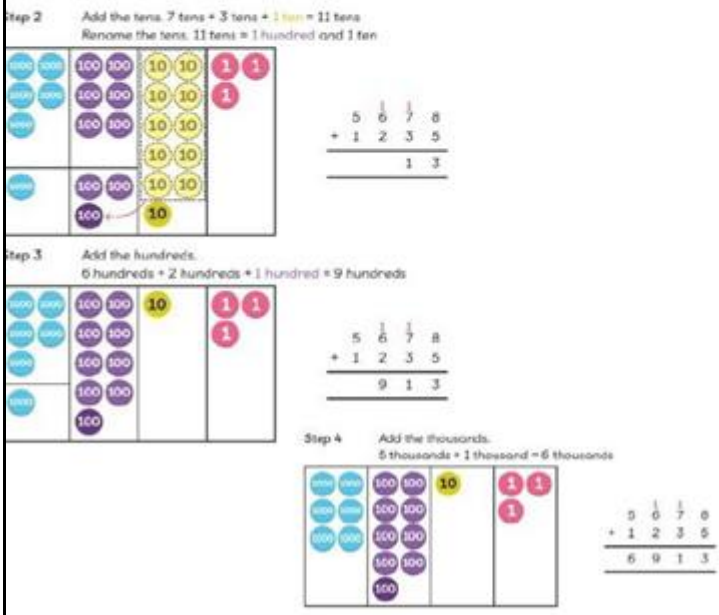
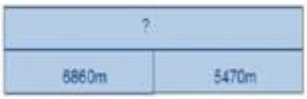
CPA examples - Addition

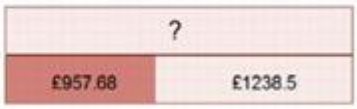
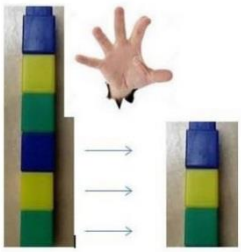
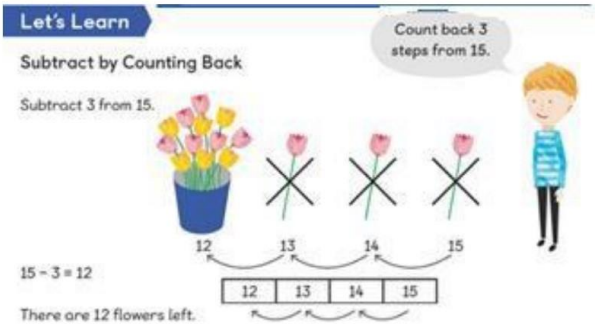
Combining two parts to make a whole: part whole model. Joining two groups and then recounting all objects (lots of practice making 10 and numbers to 10 e.g. 6 + 4 = 10 or 3 + 5 = 8)	3 + 4 = 7    
Starting at the bigger number and counting on	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer. 12 + 5 = 17  Start at the larger number on the number line and count on in ones or in one jump to find the answer.
Regrouping to make 10	 6 + 5 = 11  Start with the bigger number and use the smaller number to make 10.  Use pictures or a number line. Regroup or partition the smaller number to make 10. 

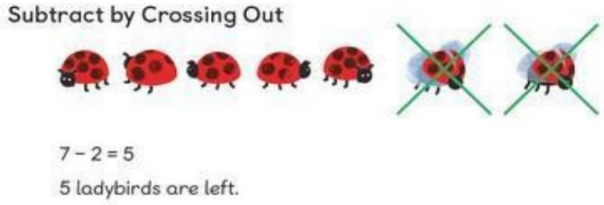
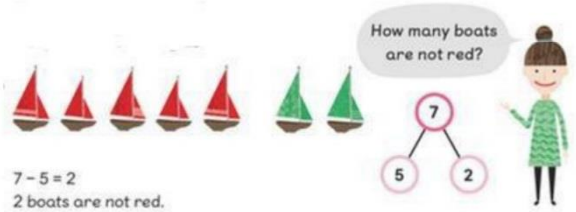
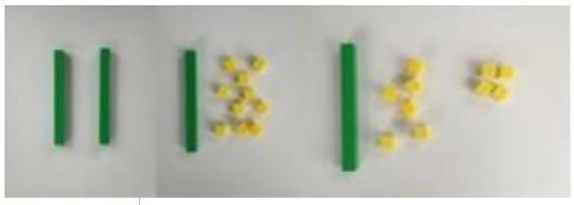
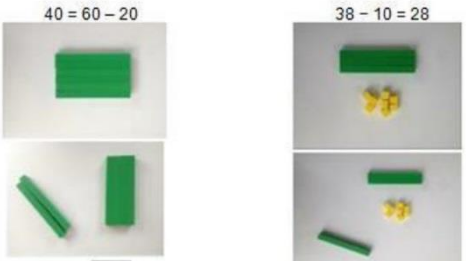
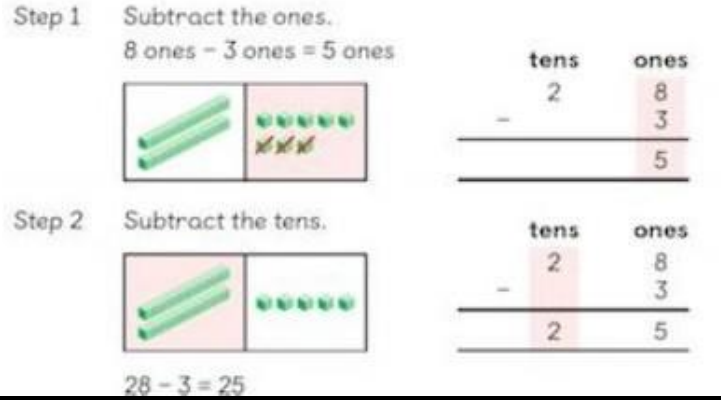
Number Bonds Learn number bonds to 20 and demonstrate related facts. Addition and subtraction taught alongside each other as pupils need to see the relationship between the facts.	
Add and subtract one digit numbers and two digit numbers to 20, including zero	8+1=9 
Bridging 10; 6 + 6 = 12 Make 9 in one and 3 in the other. Take one from the 3 to make the 9 into a ten….10+2 = 12 use ten frames, egg boxes and number lines to practice. Children should start with the larger number and add the smaller number	 6 + 6 = 12  Make 9 in one and 3 in the other. Take one from the 3 to make the 9 into a ten….10+2 = 12

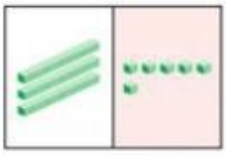
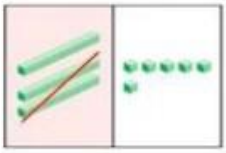
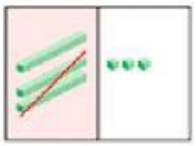
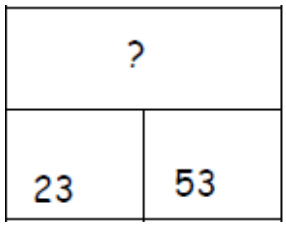
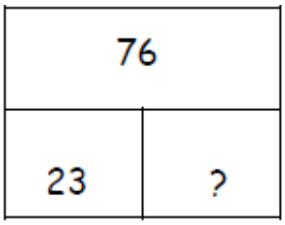
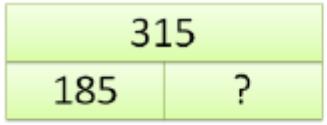
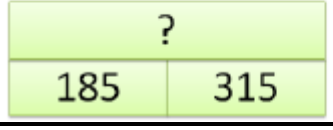
Using concrete and pictorial representations to add a 2 digit number to a 1 digit number and a 2 digit number to a tens number.	
Using concrete and pictorial representations to add two 2 digit numbers.	

Using concrete and pictorial representations to add 3 single digit numbers.	7+3+2 = leads to 10 + 2 = 
Using the bar model to find missing digits: It is important for the children to use the bar model in this way to encourage the use of it to aid problem solving.	Helen has 14 bread-sticks. Her friend has 17. How many do they have altogether? 
Add two three digit numbers. Children need to first use equipment to support understanding of place value. Start without renaming then gradually move onto renaming.	432 + 521 = Step 1 Add the ones. 2 ones + 1 one = 3 ones  Step 2 Add the tens. 3 tens + 2 tens = 5 tens  Step 3 Add the hundreds. 4 hundreds + 5 hundreds = 9 hundreds  h t o 4 3 2 + 5 2 1 3 h t o 4 3 2 + 5 2 1 5 3 h t o 4 3 2 + 5 2 1 9 5 3 236 + 345 =  1 1 h t o 2 3 6 + 3 4 5 1 1 Step 2 Add the tens. 1 ten + 3 tens + 4 tens = 8 tens  h t o 2 3 6 + 3 4 5 8 1 Step 3 Add the hundreds. 2 hundreds + 3 hundreds = 5 hundreds  h t o 2 3 6 + 3 4 5 5 8 1 236 + 345 = 581

Bar Modelling It is important for the children to use the bar model in this way to encourage the use of it to aid problem solving.	**Bar Model to support understanding of problem solving:** A man sold 230 balloons at a carnival in the morning. He sold another 86 balloons in the evening . How many balloons did he sell in all? 
Adding numbers with up to 4 digits. Again this should start with the children using equipment to support and lots of discussion about the values of digits.	2 3 1 4 + 4 2 4 0 6 5 5 4 Step 1 Add the ones. 4 ones + 0 ones = 4 ones Step 2 Add the tens. 1 tens + 4 tens = 5 tens Step 3 Add the hundreds. 3 hundreds + 2 hundreds = 5 hundreds Step 4 Add the thousands. 2 thousands + 4 thousands = 6 thousands 2314 + 4240 = 6554 
Using the bar model to find missing digits.	This is not a form of getting the correct answer but helping to guide children to the correct operation. Alison jogs 6,860 metres and Calvin jogs 5,470 metres. How far do they jog altogether? 

Adding numbers with more than 4 digits including decimals. Using place value charts and place value counters is key when understanding adding decimals.	£23.59 + £7.55 £31.14 23481 + 1362 24843 19.01 3.65 +0.7 23.36
Using the bar model to find missing digits.	This is not a form of getting the correct answer but helping to guide children to the correct operation. MacDonalds sold £9957.68 worth of hamburgers and £1238.5 worth of chicken nuggets. How much money did they take altogether? 
Adding several numbers with up to 3 decimal places.	23.361 9.080 59.770 + 1.300 93.511 Empty decimal places should be filled with zero to show Adding several numbers with different numbers of decimal places (including money and measures): • Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.
CPA examples - Subtraction	
Taking away should begin with physical objects: counters, cubes, Dienes etc	 6 -3=3
Subtraction by counting back	

Subtracting a single digit number from a single digit number and a single digit from a two digit by crossing out pictures	
Subtracting using the part part whole model (include problem solving with missing dig-its). ? - 5 = 2	
When subtracting using Dienes children should be taught to regroup (rename) a ten rod for 10 ones and then subtract from those	 20 – 4 = 16
Subtracting Multiples of 10. Using the vocabulary of 1 ten, two tens, etc, alongside 10, 20, 30 is important	
Using concrete and pictorial representations to subtract a 1 digit number from a 2 digit number	

Using concrete and pictorial representations to subtract a 2 digit number from a tens number	Step 1 Subtract the ones.  tens ones 3 6 − 2 0 6 Step 2 Subtract the tens. 3 tens − 2 tens = 1 ten  tens ones 3 6 − 2 0 1 6 36 − 20 = 16
Using concrete and pictorial representations to subtract a 2 digit number from a 2 digit number	Subtract 24 from 37. Use ▭ to help you subtract.  Step 1 Subtract the ones. 7 ones − 4 ones = 3 ones  tens ones 3 7 − 2 4 3 Step 2 Subtract the tens. 3 tens − 2 tens = 1 ten  tens ones 3 7 − 2 4 1 3 37 − 24 = 13
Recognise and use the inverse relationship between addition and subtraction.	  Use this to check calculations and solve missing number problems.
Bar Modelling It is important for the children to use the bar model in this way to encourage the use of it to aid problem solving.	 315 − 185 = ? 185 + ? = 315  185 + 315 = ? ? − 185 = 315

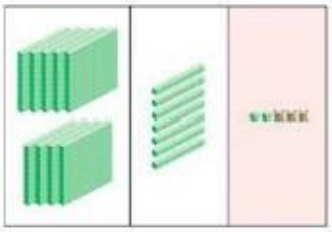
Subtract up to 3 digits from 3 digits.

Children need to first use equipment to support understanding of place value.

Only when children are secure with method should exchanging be introduced.

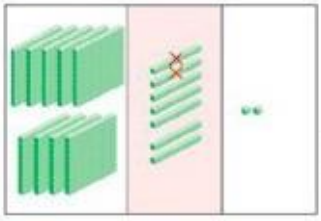
Subtract 723 from 975.

Step 1 Subtract the ones.
5 ones − 3 ones = 2 ones



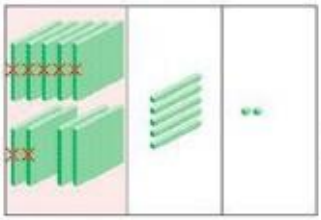
	h	t	o
	9	7	5
−	7	2	3
			2

Step 2 Subtract the tens.
7 tens − 2 tens = 5 tens



	h	t	o
	9	7	5
−	7	2	3
		5	2

Step 3 Subtract the hundreds.
9 hundreds − 7 hundreds = 2 hundreds

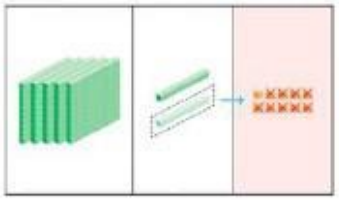


	h	t	o
	9	7	5
−	7	2	3
	2	5	2

975 − 723 = 252

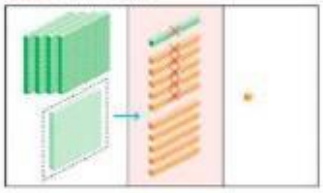
Subtract 269 from 520.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
10 ones − 9 ones = 1 one



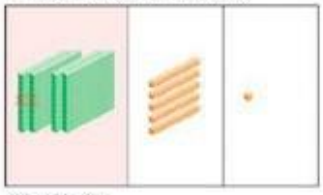
	h	t	o
	5	~~2~~ 1	~~0~~ 10
−	2	6	9
			1

Step 2 Regroup 1 hundred for 10 tens.
Subtract the tens.
11 tens − 6 tens = 5 tens



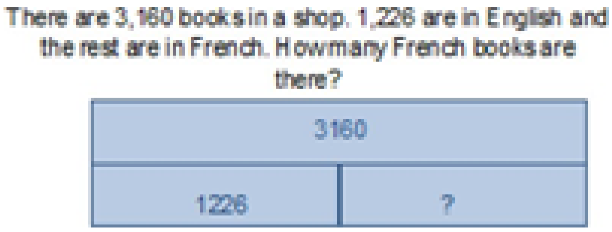
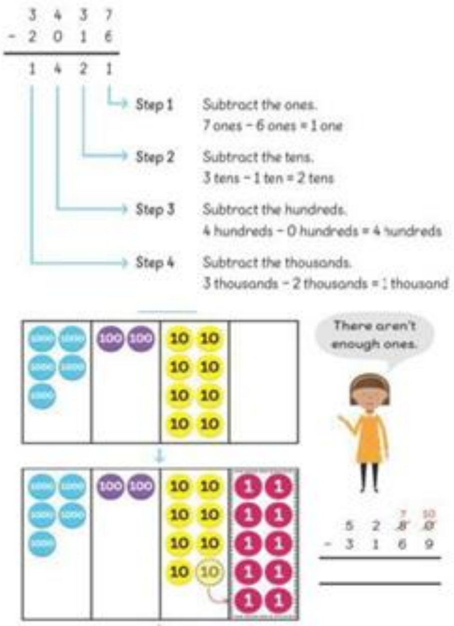
	h	t	o
	~~5~~ 4	~~2~~ 11	~~0~~ 10
−	2	6	9
		5	1

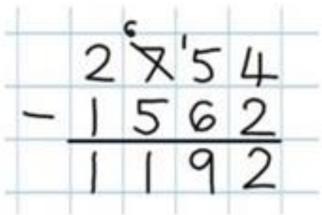
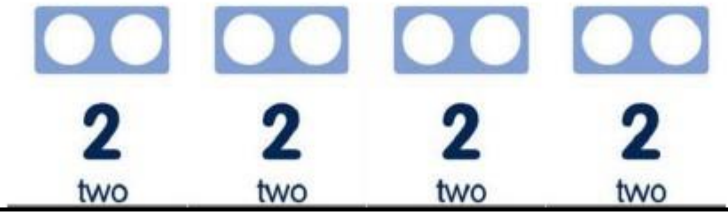
Step 3 Subtract the hundreds.
4 hundreds − 2 hundreds = 2 hundreds

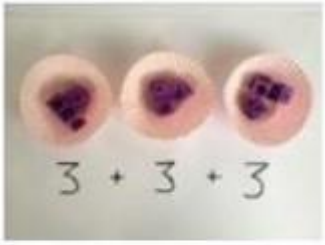
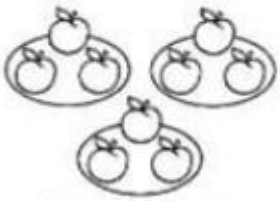
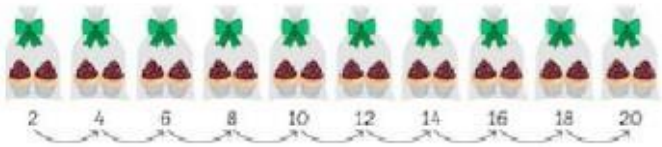
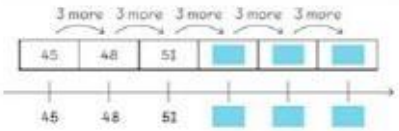


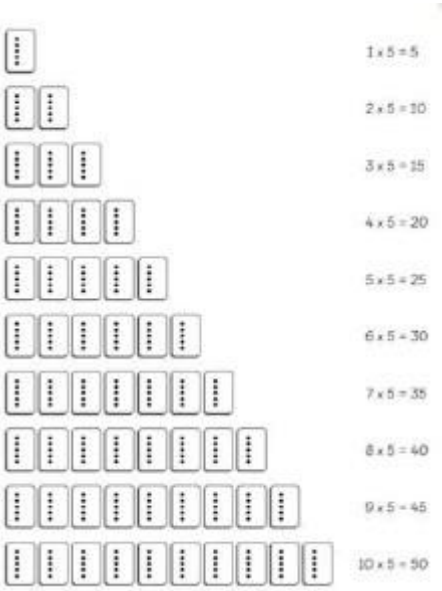
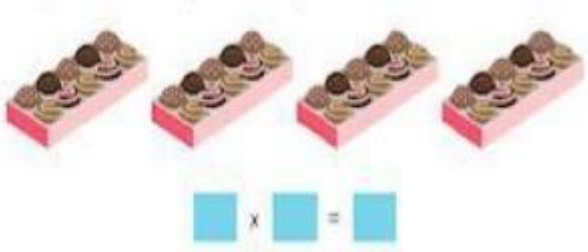
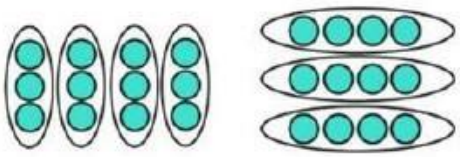
	h	t	o
	~~5~~ 4	~~2~~ 11	~~0~~ 10
−	2	6	9
	2	5	1

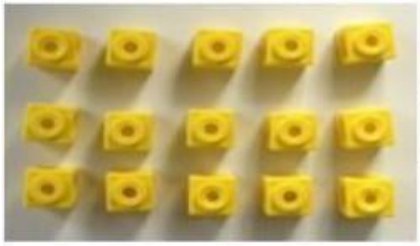
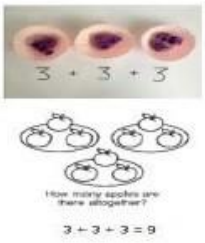
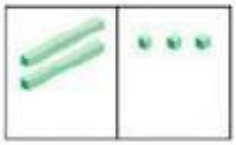
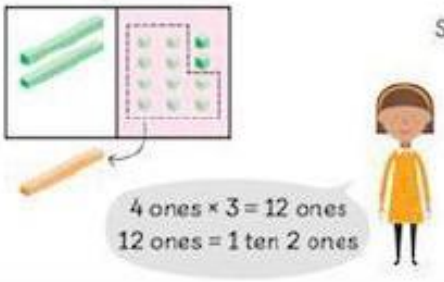
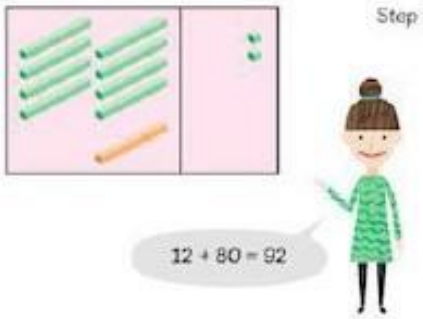
520 − 269 = 251

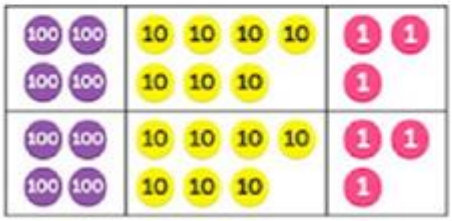
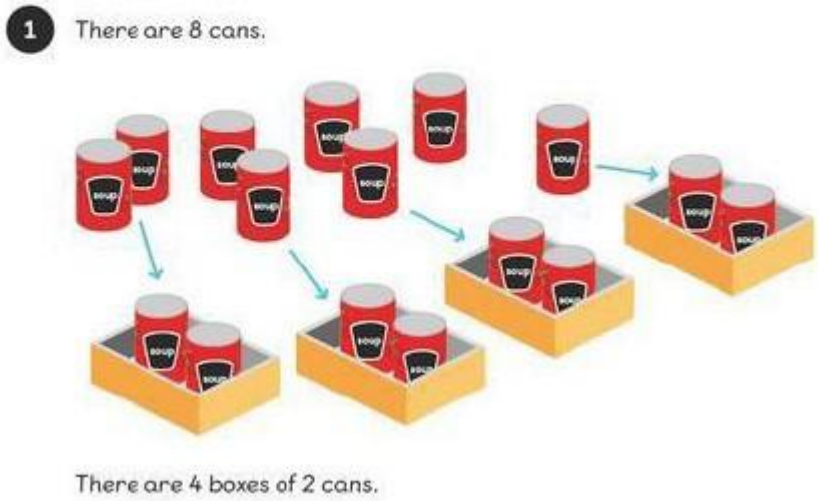
<table>
<tr><td>Using the bar model to find missing digits.</td><td> 
</td></tr>
<tr><td>Subtract with numbers up to four digits, including exchanging.</td><td> 

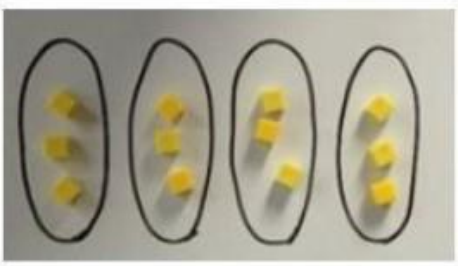
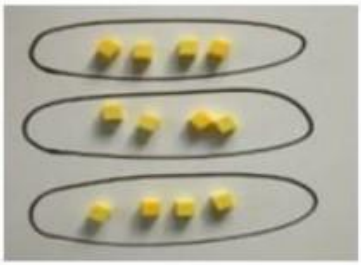
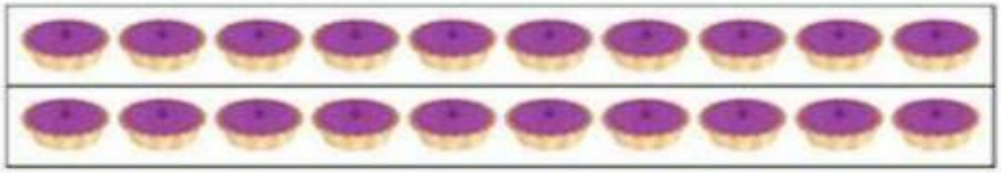
 </td></tr>
<tr><td colspan="2"><h2>CPA examples - Multiplication</h2></td></tr>
<tr><td>Counting in Multiples of 2, 5 and 10 from zero.
Children should count the number of groups on their fingers as they are skip counting.</td><td>2 4 6 8
4 groups of 2 = 8
4 x 2 = 8
 
2 × 4 = 8
 
</td></tr>
</table>

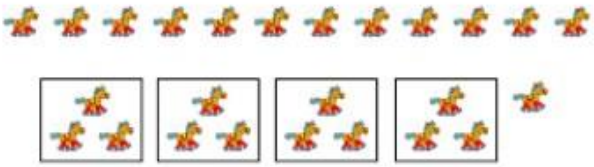
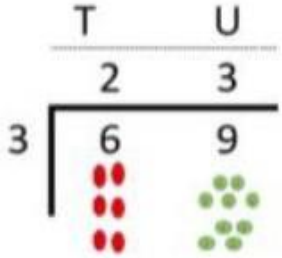
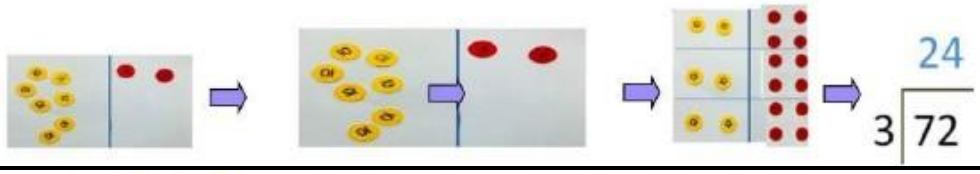
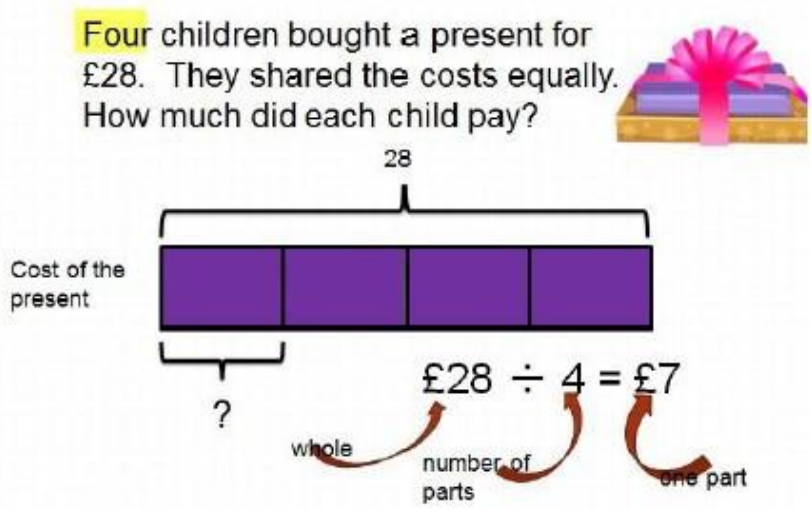
When moving to pictorial/written calculations the language is important	 This image represents two groups of 4 or 4 twice
Solving Multiplication Problems using repeated addition	  How many apples are there altogether? 3 + 3 + 3 = 9
Skip counting in multiples of 2, 3, 5 and 10 from zero.	 

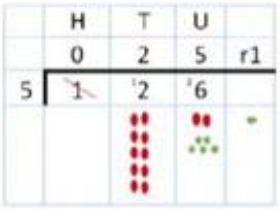
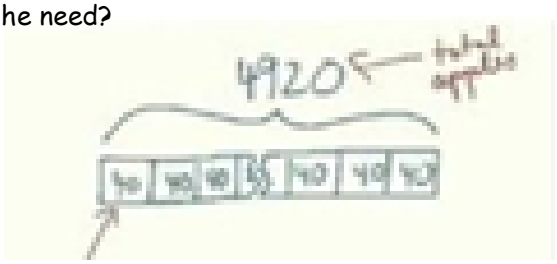
Recall and reuse multiplication facts for the 2, 5 and 10 times tables.	
Use multiplication sign (X) and equals sign (=) when writing out multiplication tables.	
Understand that multiplication is commutative Pupils should understand that an array can represent different equations and that as multiplication is commutative the order doesn't affect the answer.	How many dots are there?  2 x 5 = 10 5 x 2 = 10 2 × 5 is equal to 5 × 2.  12 = 3 × 4 12 = 4 × 3

Solve multiplication problems using arrays and repeated addition.	 3 x 5 = ☐ 5 x 3 = ☐ 
Children should be able to recall the 2, 5, 10, 3, 4 and 8 multiplication tables. Multiply a 2 digit number by a 1 digit number.	**Let's Learn** 1 There are 4 groups of 23 fish. How do we multiply 23 by 4?  Step 1 Multiply the ones by 4.  t o 2 3 × 4 1 2  Step 2 Multiply the tens by 4. t o 2 3 × 4 1 2 8 0  Step 3 Add the products. t o 2 3 × 4 1 2 + 8 0 9 2 23 × 4 = 92 There are 92 fish in 4 tanks.

Children know all times tables up to 12 x 12. Children use expanded column multiplication	314 × 3 12 (3 × 4) 30 (3 × 10) + 900 (3 × 300) 942  
Multiply using the bar model	A computer costs 5 times as much as a television. The television costs £42. How much does the computer cost? 
CPA examples - Division	
Pupils should be taught to divide by working practically and the sharing should be shown below the whole to familiarise children with the concept of the whole.	10 ÷ 2 = 5 

Solve division problems in context by using concrete objects by sharing.	There are 18 sausages.  Put 18 sausages equally on 2 plates.   2 × 9 = 18 There are 9 sausages on each plate. 18 ÷ 2 = 9
Solve division problems in context using arrays.	 
Solve division using grouping.	Put 10 buns in groups of 2. How many plates are there?   Put into groups of 5. There are ☐ groups.
Use the inverse This should be taught alongside both multiplication and division.	Make a family of multiplication and division facts.  2 x 10 = 20 ——— 20 ÷ 10 = ☐ 10 x 2 = 20 ——— 20 ÷ 2 = ☐

Dividing and grouping understanding the concept of remainders.	Start with using the real objects-or objects that represent the calculation.  13 ÷ 4 = 3 Remainder 1
Dividing using short division Once the children are secure with division as grouping and can demonstrate this on number lines, arrays etc. short division should be introduced for dividing larger 2 digit numbers. Initially with carefully chosen calculations requiring no remainders. Compare the layout of short division and that of an array.	 **Remind children of correct place value, that 69 is equal to 60 and 9, but in short division, pose:** · *How many 3's in 6? = 2, and record it above the* ***6 tens****.* · *How many 3's in 9? = 3, and record it above the* ***9 ones****.* Once children demonstrate a full understanding of remainders, and also the short division method taught, they can be taught how to use the method when remainders occur within the calculation (e.g. 72÷3), and be taught to 'carry' the remainder onto the next digit. 
Bar Modelling It is important for the children to use the bar model in this way to encourage the use of it to aid problem solving.	 Four children bought a present for £28. They shared the costs equally. How much did each child pay? 28 Cost of the present ? £28 ÷ 4 = £7 whole number of parts one part

Dividing 3 digit numbers by a 1 digit number using short division.	 
Using the bar model to support division	Frank has 4920 apples. He needs to put them into baskets of 40. How many baskets does he need? 
Long division to divide by 2 digit number.