All children must be able to use these met before moving on to other methods

Year 3 ← Year 4 ← Year 5

- plus
- make
- increase
- together

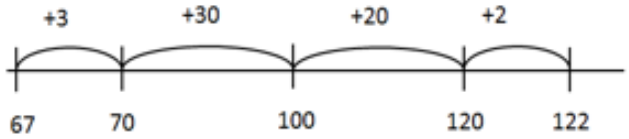
Using Place value

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

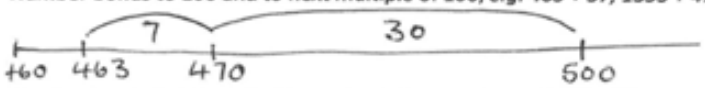
Counting on

To jump to the next multiple of ten – reinforce the use of number bonds



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 next whole number, *e.g. 4.6 + 0.4, 7.2 + 0.8*

Build on partitioning to develop expanded column addition with two 3-digit numbers

466 + 358 =

400	60	6
+300	50	8
700	110	14

- Start by adding the ones

Expanded column addition with 'carrying'
Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers

400	60	6
+ 300	50	8
100	10	
800	20	4

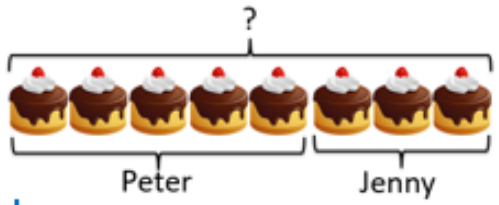
- Start by adding the ones

Build on expanded column addition to develop compact column addition

1000	400	60	6
+ 4000	800	60	8

Peter has 5 cakes and Jenny has 3 ca
How many cakes do they have altoget

Concrete/Pictorial Model



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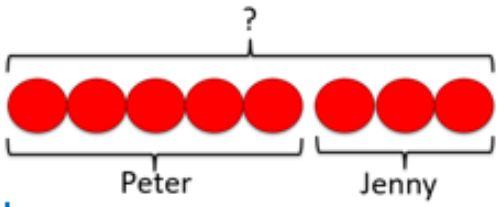
Pictorial Model



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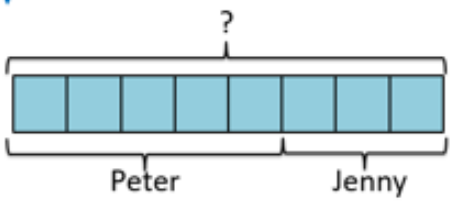
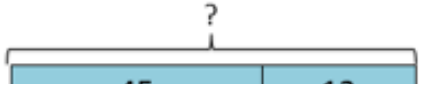
Discreet Bar Model



Usin squa repre the

Class 1 have 45 pencils and Class 2 h
many pencils do they have

Fully Continuous Model



Year 6

Compact column addition with larger numbers.

Use expanded and compact column addition to add amounts of money.

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

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

Compact column addition to add Pairs of 5-digit numbers

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

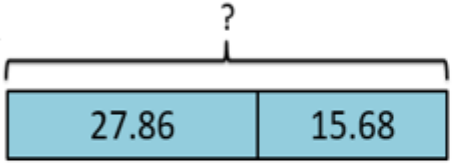
Continue to use column addition to add towers of several larger numbers.

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

27.86 + 15.68 =

```
 15.68
+27.86
 11.1
 43.54
```

The length of Jenny's hair was 27.86cm in March. Since t has grown by 15.68cm. How long is it now?

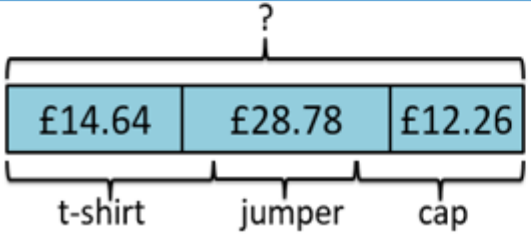


Compact column addition for adding several large numbers and decimal numbers with up to two places

£14.64 + £28.78 + £12.26 =

```
 £14·64
+£28·78
 £12·26
   11·1
 £55·68
```

Peter buys a t-shirt for £14.64, a jumper for £28.78 and a for £12.26. How much did his shopping cost altogether



Question mark t label what you looking to solve.

All children must be able to use these methoc
before moving on to other strategies

Year 3

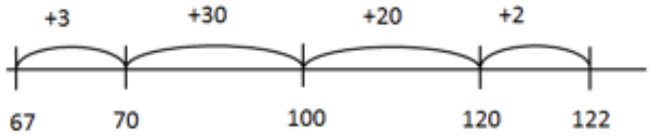
Subtract near multiples, *e.g. 648 – 199 or 86 – 39*

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

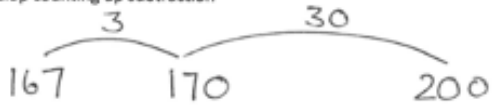
Find the difference between 122 and 67 by counting on

To jump to the next multiple of ten – reinforce the use of number bonds

122-67=55



Develop counting up subtraction

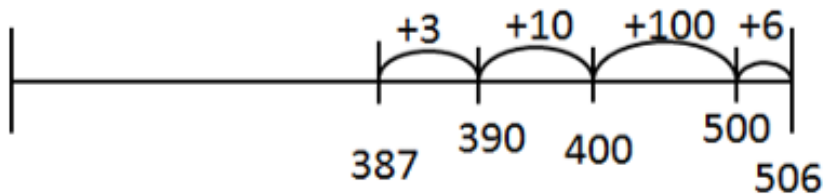


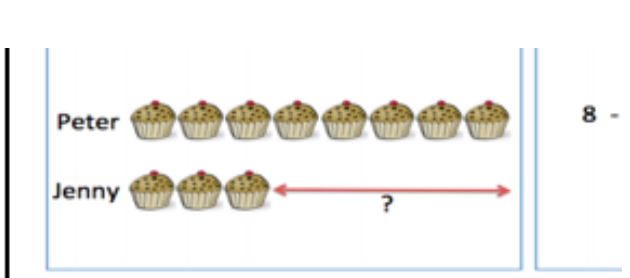
Use counting up subtraction to find change from £1 and £10

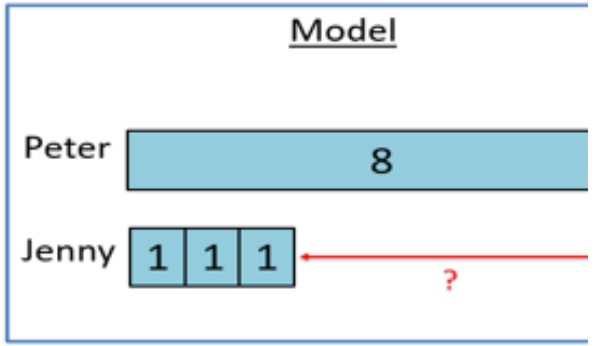
Recognise complements of any fraction to 1, *e.g. 1 – ¼ = ¾ or 1 – ⅔ = ⅓*

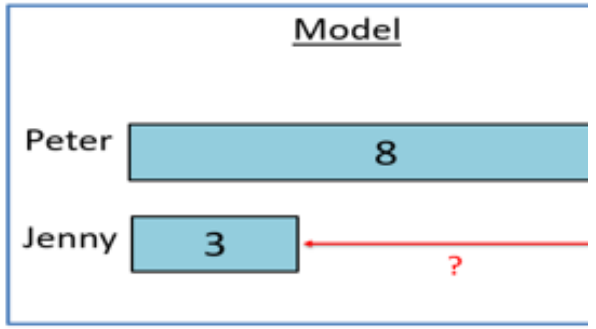
Counting up

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



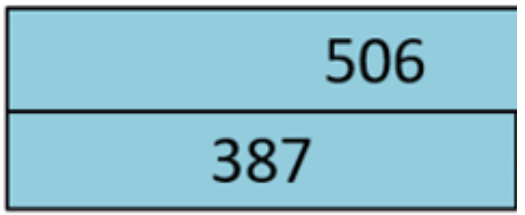






Use a number line be

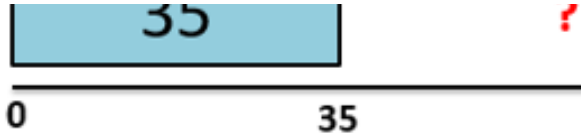
506 - 387=



Year 5

Year 6

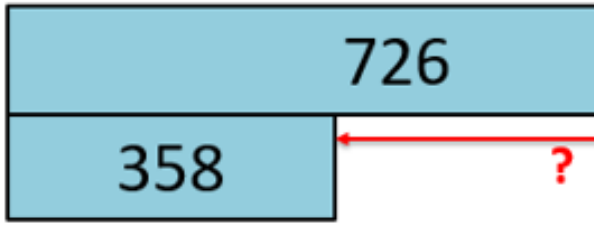
30 + 4



Expanded column subtraction

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

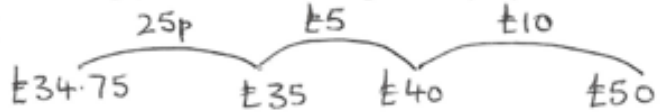
Expanded column subtraction with exchanging.



Begin to use compact column subtraction

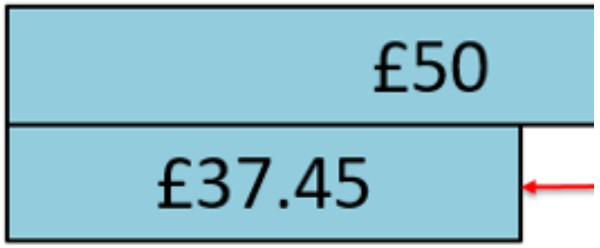
6 11 16
~~7~~ ~~2~~ ~~6~~
− 3 5 8
3 6 8

Use counting up subtraction to find change from £10, £20, £50 and £100



Subtract like fractions, *e.g.* $^{3}/_{8} - {}^{1}/_{8} = {}^{2}/_{8}$

Peter brought a coat for £37.45. He pay
much change will he get



Compact column subtraction for numbers with up to 5 digits

0 15 13 1 14

Key Vocabulary

- *subtract*
- *minus*
- *less t*
- *numb*

All children must be able to use the methods before moving on to other

Year 3

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).

48
80 + 16 = 96

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.

Pictorial bar model

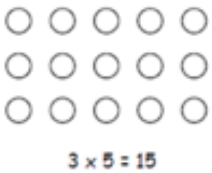
Model

?

Calcula

6 x 4 =

Use arrays:



5 x 3 = 15

3 x 5 = 15

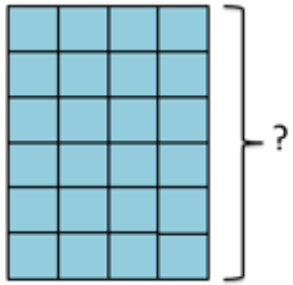
5 x 3 = 3 + 3 + 3 + 3 + 3 = 15

3 x 5 = 5 + 5 + 5 = 15

Use arrays to help teach children to understand the commutative law of multiplication, and give examples such as 3 x __ = 6.

Use practical apparatus:

Use Numicon and counters to create arrays.



?

6 x 4 = 24

4 x

Introduce the **grid method** for multiplying 2-digit by single digit numbers.
Start by repeating addition alongside array.

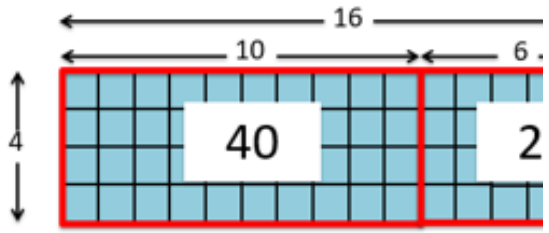
Use concrete resources to show grid method. E.g. counters

x	10	6
4	10	6
	10	6
	10	6
	10	6
	40	24

= 64

x	10	6
4	40	24

= 64



Build on partitioning to develop grid multiplication.
Use grid multiplication to multiply 3-digit by 1-digit numbers.

	10	10	4
4	40	40	12

In one bag there are 23 sweet
How many are there in 4 bags

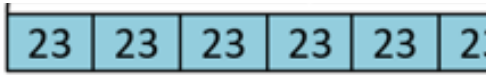
Model

?

Year 4

720 108
= 828

140 20x7
161



Year 5

Use column multiplication (ladder) to multiply 3-digit by 1-digit.

346X9 is approxumately 350X10=3,500

346
x 9
54 6X9
360 40X9
2700 300X9
3114

4346 X 8 is approximately 4500X10 = 45,000

4346
x 8
48 6X8
320 40X8
2,400 300X8
32,000 4000X8
34,768

Extend to simple decimal numbers with one decimal place.

Know that decimals should be lined up correctly based on their place value.

Know that 4.9 x 3 = (49 x 3) ÷ 10.

Use grid method as default, then understanding of ÷ 10.

Year 6

Long multiplication 2 digit by 2 digit

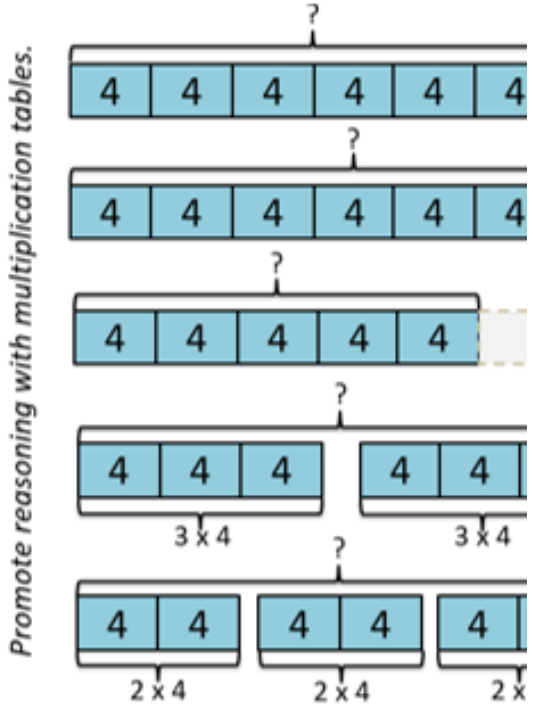
72 × 38 is approximately 70 × 40 = 2800.

72
× 38
72 × 30 2160

258
x 16
2580
1548
1
4128

Bar modelling and reasoning:

- "If I know, I also know..."
- Can be applied to higher numbers



Key vocabulary:

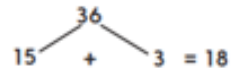
- *multiply*
- *times by*
- *lots of*

ildren must be able to use these methods before moving on to other strat

0 5 10 15 20

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.

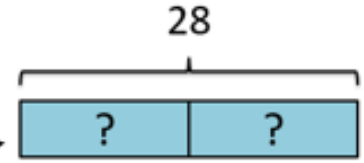


Grouping
Recognise that division is not commutative, e.g. 16 ÷ 8 does not equal 8 ÷ 16.
Relate division to multiplications 'with holes in', e.g. □ x 5 = 30 is the same calculation as 30 ÷ 5 = ? thus we can count in 5s to find the answer.
Divide multiples of 10 by single-digit numbers, e.g. 240 ÷ 8 =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

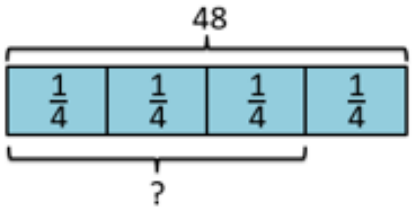
Using number facts
Know halves of even numbers to 40.

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. ¼ of 48 is 3 x (48 ÷ 4).

- *Use a question mark to show wh*



Using bar model to visualise halv



Question mark you are workin

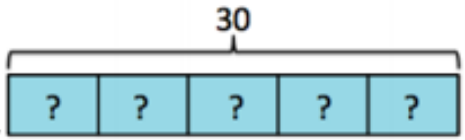
Using number facts
Know times tables up to 12 x 12 and all related division facts.
Use division facts to find unit and non-unit fractions of amounts within the times tables, e.g. ⅞ of 56 is 7 x (56 ÷ 8).

Know and understand sharing and grouping:

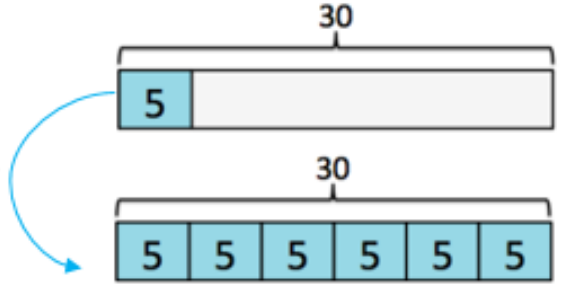
Children should be taught to recognise whether problems require sharing or grouping.

Sharing:
Jenny has 30 cakes. She wants to share them equally into 5 boxes. How many cakes should go in each box?

Grouping:
Jenny has 30 cakes. She wants to pack them into boxes, with 5 cakes in each box. How many boxes will she need to pack all the cakes?



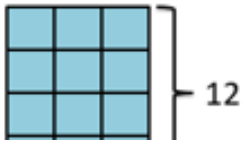
Use a bar to



Work out needed by are hidin

Arrays

This represents 12 ÷ 3, posed as 'how many 3s are hiding in 12?'

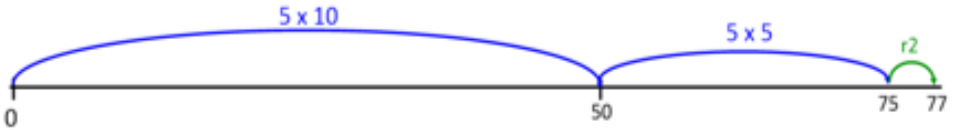


Arrays are bar model

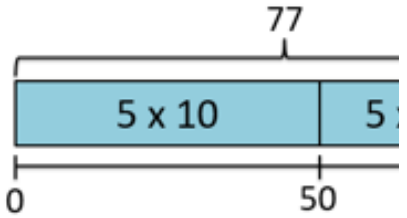
Year 4

Leading to:

77 ÷ 5 =



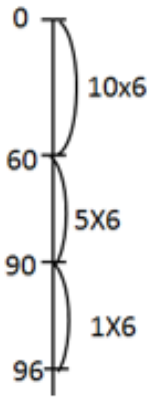
= 15 groups of 5 and 2 leftover
= 15 remainder 2



Year 5

Chunking method: Support by using a vertical number line as a bridge between methods.

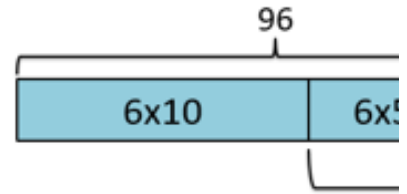
96÷6=16



$$
\begin{array}{r|l}
6 & 96 \\
-\ 60 & 6\times10 \\
\hline
 & 36 \\
-\ 30 & 6\times5 \\
\hline
 & 6 \\
-\ 6 & 6\times1 \\
\hline
 & 0
\end{array}
$$

Must be aligned in place value for subtracting.

$96 \div 6 = 16$



Year 6

Introduce long division by chunking for dividing by 2 digits:

$$
\begin{array}{r|l}
 & 27 \\
\hline
36 & 972 \\
-\ 720 & 20\times \\
\hline
 & 252 \\
-\ 252 & 7\times \\
\hline
 & 0
\end{array}
$$

Answer : 27

- Find out 'How many 36s are hiding in 972?' by subtracting 'chunks' of 36 until zero is reached (or until there is a remainder).
- Teach pupils to write a 'useful' list first at the side that will help them decide what chunks to use. E.g. 'Useful' list: 1x = 36
  10x = 360
  100x = 3600
- Introduce the method in a simple way by limiting the choice of chunks to 'Can we use 10 lots? Can we use 100 lots?' As children be confident with the process, encourage more efficient chunks to get the answer more quickly (e.g. 20x, 5x), and expand on their 'use

Extend to decimals with up to two decimal places. It is much easier for pupils to convert the decimal to a whole number and then convert the answer back to a

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

$$
\begin{array}{r|l}
 & 1\ 2\ 6\ 4 \\
\hline
6 & 7\ {}^{1}5\ {}^{3}8\ {}^{2}4
\end{array}
$$

Short division, for dividing by a single digit: e.g. 6497 ÷ 8