Year 1			
Addition	Subtraction	Multiplication	Division

Addition

= signs and missing numbers
Children need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'.
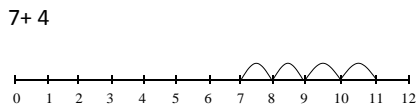
$2 = 1 + 1$
$2 + 3 = 4 + 1$
$3 = 3$
$2 + 2 + 2 = 4 + 2$

Missing numbers need to be placed in all possible places.

$3 + 4 = \square$ $\square = 3 + 4$
$3 + \square = 7$ $7 = \square + 4$
$\square + 4 = 7$ $7 = 3 + \square$
$\square + \nabla = 7$ $7 = \square + \nabla$

The Number Line

Children use a numbered line to count on in ones. Children use number lines and practical resources to support calculation and teachers *demonstrate* the use of the number line.

$7 + 4$

Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences
Recording by
 - drawing jumps on prepared lines

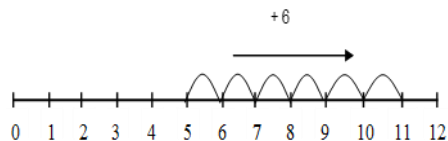**Subtraction**

- = signs and missing numbers

$7 - 3 = \square$ $\square = 7 - 3$
$7 - \square = 4$ $4 = \square - 3$
$\square - 3 = 4$ $4 = 7 - \square$
$\square - \nabla = 4$ $4 = \square - \nabla$

- Understand subtraction as 'take away'

- Find a 'difference' by counting up;

I have saved 5p. The socks that I want to buy cost 11p. How much more do I need in order to buy the socks?

- Use practical and informal written methods to support the subtraction of a one-digit number from a one digit or two-digit number and a multiple of 10 from a two-digit number.

I have 11 toy cars. There are 5 cars too many to fit in the garage. How many cars fit in the garage?

-5
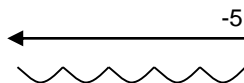
Multiplication

Multiplication is related to doubling and counting groups of the same size.

Looking at columns   Looking at rows
$2 + 2 + 2$ $3 + 3$
3 groups of 2   2 groups of 3

Counting using a variety of practical resources
Counting in 2s e.g. counting socks, shoes, animal's legs…
Counting in 5s e.g. counting fingers, fingers in gloves, toes…
Counting in 10s e.g. fingers, toes…

Pictures / marks

There are 3 sweets in one bag.
How many sweets are there in 5 bags?

Division

Sharing

Requires secure counting skills

Develops importance of one-to-one correspondence

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

Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into cups, hoops etc.

Grouping

Sorting objects into 2s / 3s/ 4s etc
How many pairs of socks are there?

There are 12 crocus bulbs. Plant 3 in each pot. How many pots are there?
Jo has 12 Lego wheels. How many cars can she make?

Year 2			
Addition	Subtraction	Multiplication	Division

Addition

+ = signs and missing numbers
Continue using a range of equations as in Year 1 but with appropriate, larger numbers.
Extend to
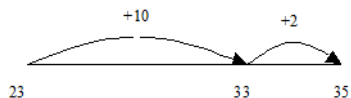14 + 5 = 10 + □
and
32 + □ + □ = 100   35 = 1 + □ + 5

Partition into tens and ones and recombine
12 + 23 = 10 + 2 + 20 + 3
       = 30 + 5
       = 35
Count on in tens and ones
23 + 12 = 23 + 10 + 2
       = 33 + 2
       = 35

+10   +2

23   33   35

Add 9 or 11 by adding 10 and adjusting by 1

e.g. Using a 100 square

Add 9 by adding 10 and adjusting by 1
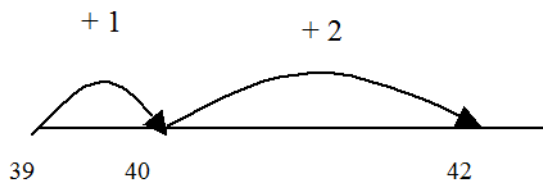35 + 9 = 44

35   44 45

Subtraction

- = signs and missing numbers
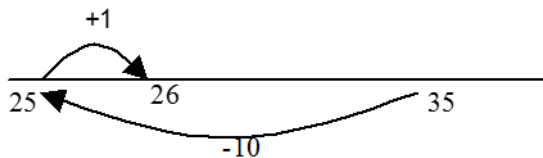Continue using a range of equations as in Year 1 but with appropriate numbers.
Extend to 14 + 5 = 20 - □
Find a small difference by counting up
42 – 39 = 3

+ 1   + 2

39   40   42

Subtract 9 or 11. Begin to add/subtract 19 or 21

e.g. Using a 100 square
35 – 9 = 26

+1
25   26   35
        -10

Use known number facts and place value to subtract
(partition second number only)
37 – 12 = 37 – 10 – 2
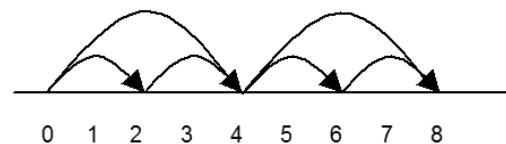   = 27 – 2
       = 25

25   27   37

Multiplication

x = signs and missing numbers

7 x 2 = □	□ = 2 x 7
7 x □ = 14	14 = □ x 7
□ x 2 = 14	14 = 2 x □
□ x ∇ = 14	14 = □ x ∇

Arrays and repeated addition

● ● ●   4 x 2 or 4 + 4
● ● ●
     2 x 4 or 2 + 2 + 2 + 2

0 1 2 3 4 5 6 7 8

Partition
Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways: 6 = 5 + 1 so e.g. Double 6 is the same as double five add double one.

Doubling multipes of 5 up to 50

 15 x 2 = 30 Using arrays

AND double 15
10   +   5
↓   ↓
20   +   10   = 30

Division

÷ = signs and missing numbers

6 ÷ 2 = □	□ = 6 ÷ 2
6 ÷ □ = 3	3 = 6 ÷ □
□ ÷ 2 = 3	3 = □ ÷ 2
□ ÷ ∇ = 3	3 = □ ÷ ∇

Grouping
Link to counting and understanding number strand
Count up to 100 objects by grouping them and counting in tens, fives or twos;…
Find one half, one quarter and three quarters of shapes and sets of objects
6 ÷ 2 can be modelled as:
There are 6 strawberries.
How many people can have 2 each? How many 2s make 6?

6 ÷ 2 can be modelled as:

0 1 2 3 4 5 6

In the context of money count forwards and backwards using 2p, 5p and 10p coins

Practical grouping e.g. in PE

12 children get into teams of 4 to play a game. How many teams are there?

Year 3			
Addition	Subtraction	Multiplication	Division

Addition

When adding larger numbers, it becomes less efficient to count on so partitioning is used.
Partition into (hundreds) tens and ones, add to form partial sums and then recombine.

Example:

Partitioned numbers are written under one another:

$47 + 76 = 40 + 70 = 110$
$\quad\quad = 7 + 6 = \underline{13}$
$\quad\quad\quad\quad\quad 123$

Or

$375 + 567 = 300 + 500 = 800$
$\quad\quad\quad = 70 + 60 = 130$
$\quad\quad\quad = 5 + 7 = \underline{12}$

$800 + 130 + 12 = 942$

Begin to add numbers with up to three digits, using formal written methods of columnar addition, starting with "friendly" numbers and then moving on to carrying.

Subtraction

Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers mentally and using number lines

e.g. *423 – 357*

Begin to subtract numbers with up to three digits, using formal written methods of columnar subtraction using decomposition

$^{6}7^{1}4$
$\underline{-27}$
$\quad 47$

Say, "60 – 20" or, "6 tens – 2 tens" not, "6 – 4"

$^{4}5^{1}63$
$\underline{-271}$
$\quad 292$

Say, "60 – 20" or, "6 tens – 2 tens" not, "6 – 4"

Layout as illustrated in the examples.

Children should still be taught to use a number line if appropriate, for example counting on to give change from a £20 note.

Multiplication

Use partitioning (grid multiplication) to multiply
2-digit and 3-digit numbers by 'friendly' 1-digit numbers

Partition the 2 diigt number and multiply each part

x	30	4
6	180	24

Add the answers in the grid using column addition

$\quad 180$
$\underline{+\ 24}$
$\quad 204$
$\quad\ \ 1$

Partition both numbers and multiply each part

x	100	20	7
4	400	80	28

Add the answers in the grid using column addition

$\quad 400$
$\quad\ 80$
$\underline{+28}$
$\quad 508$
$\quad\ \ 1$

Division

Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number.

Use partitioning to halve numbers.

Say, "Half of 60 is 30, not "half of 6 is 3"

64
$30 + 2$
32
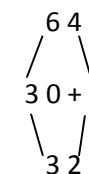
Use "Bus stop" method to recall times table facts and apply inverse operation skills in order to divide.

21 pencils shared between 3 children = 7 pencils each:

3 6 9 12 15 18 <u>21</u> 24 27 30 33 36
1 2 3 4 5 6 <u>7</u>

		Use partitioning to double numbers. Say "double 60 is 120, not double 6 is 12" $$\begin{array}{c}6\ 4\\ \diagup\ \diagdown\\ 1\ 2\ 0\ +\ 8\\ \diagdown\ \diagup\\ 1\ 2\ 8\end{array}$$ Use "Bus stop" method to recall times table facts mentally. 3 children each have 7 pencils: Recall, 7 14 21 $\qquad$ 1 2 3	
— Fractions And Percentages			

Fractions And Percentages

Begin to add like fractions $\qquad$ e.g. $^{3}/_{8} + {}^{1}/_{8} + {}^{1}/_{8}$ Recognise fractions that add to 1 e.g. $^{1}/_{4} + {}^{3}/_{4}$ e.g. $^{3}/_{5} + {}^{2}/_{5}$	Begin to subtract like fractions $\qquad$ e.g. $^{7}/_{8} - {}^{3}/_{8}$		Find unit fractions of quantities and begin to find non-unit fractions of quantities.

Year 4			
Addition	Subtraction	Multiplication	Division
Pupils should be taught to: add numbers with up to 4 digits using the formal written methods of columnar addition where appropriate including carrying	Pupils should be taught to subtract numbers with up to 4 digits using the formal written methods of columnar subtraction with partitioning where appropriate.	Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method) 16 x 34 | x	30	4
---	---	---
10	300	40
6	180	24 | 480 + 64 480 +64 544 Use a vertical written method to multiply a 1-digit number by a 2 and 3-digit number (expanded ladder method) 34 X6 24 ← 6 x 4 180 ← 6 x 30 204	Divide a 2-digit or a 3-digit number by a 1-digit number. Give remainders as whole numbers. Begin to reduce fractions to their simplest forms Find unit and non-unit fractions of larger amounts
Fractions And Percentages			
Add like fractions e.g. $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$ Be confident with fractions that add to 1 and fraction complements to 1 e.g. $\frac{2}{3} + \_ = 1$	Subtract fractions with the same denominator within one whole		

Year 5			
Addition	Subtraction	Multiplication	Division

Use column addition to add two or three whole numbers with up to 5 digits
 	
Use column addition to add any pair of 2-place decimal numbers, including amounts of money
 	
Choose the most efficient method in any given situation
	Use column subtraction to subtract numbers with up to 5 digits
	
	Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000
	
	Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money
	
	Choose the most efficient method in any given situation
		Use expanded (ladder) multiplication to multiply a 4-digit number by a 1 digit number
		
		    1234
		    X6
		    24 ← 6 x 4
		   180 ← 6 x 30
		 1200 ← 6 x 200
		 6000 ← 6 x 1000
		 7404
		
		Introduce short (compact) multiplication, with carrying, to multiply a number with up to 4 digits by a 1-digit number
		
		   1234
		   X6
		   7404
		
		Choose the most efficient method in any given situation
			Use Repeated subtraction (chunking) to divide three and four digit number by two digit number 1 3
			
			195 ÷ 15 15 | 1 9 5
			              - 6 0 | 4
			
			                1 3 5
			            - 1 2 0 | 8
			
			                 1 5
			            - 1 5 | 1
			
			 Answer 13 0
			Introduce short division to divide a number with up to 4 digits by a number ≤ 12
			Give remainders as whole numbers or interpret appropriately for the context
			
			Short division
			Example without remainder:
			81 ÷ 3
			       2 7
			  3 | 8²1
			
			Children use their knowledge of the 3 times table to find, "How many 3s in 80 where the answer is a multiple of 10?" This gives 20 threes (since 30 threes would be too many), with 20 remaining (2 tens are carried over to the next column) Now ask: 'How many threes in 21".
			With remainder
			         4 7 r 2
			  6 | 2 8⁴4

Fractions And Percentages			
Begin to add related fractions using equivalences e.g. $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6}$	Begin to subtract related fractions using equivalences e.g. $\frac{1}{2} - \frac{1}{6} = \frac{2}{6}$	Find simple percentages of amounts e.g. *10%, 5%, 20%, 15% and 50%* Begin to multiply fractions and mixed numbers by whole numbers ≤ 10 e.g. *4 × $\frac{2}{3}$ = $\frac{8}{3}$ = 2 $\frac{2}{3}$*	Find non-unit fractions of large amounts Turn improper fractions into mixed numbers and vice versa

Year 6			
Addition	Subtraction	Multiplication	Division
Use column addition to add numbers with up to 6 digits. Use column addition to add decimal numbers with up to 3 decimal places	Use column subtraction to subtract numbers with up to 6 digits Use column subtraction to subtract decimal numbers with up to 3 decimal places Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10 000 Use complementary addition for subtractions of decimal numbers with up to 3 places, including money	Use expanded (ladder) multiplication to multiply a 4-digit number by a number with up to 2 digits Use expanded (ladder) multiplication to multiply a number with 1 or 2 decimal places, including amounts of money by a number with up to 2 digits Use short multiplication to multiply a number with up to 4 digits by a 1 or 2 digit number Use short multiplication to multiply a number with 1 or 2 decimal places, including amounts of money by a 1 or 2 digit number	Use chunking long division to divide 4-digit and 5-digit numbers by up to 2-digit numbers Use chunking long division to divide numbers with up to 2 decimal places including amounts of money by numbers up to 2 digit Use short division to divide a number with up to 4 digits by a 1-digit number Use short division to divide numbers with up to 2 decimal places including amounts of money by a 1-digit number Give remainders as whole numbers or as fractions or as decimals
Fractions And Percentages			
Add mixed numbers and fractions with different denominators	Subtract mixed numbers and fractions with different denominators	Multiply fractions and mixed numbers by whole numbers Multiply fractions by proper fractions Use percentages for comparison and calculate simple percentages	Divide proper fractions by whole numbers