Year 3

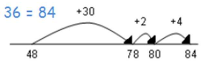
Number – addition and subtraction

add numbers mentally, including:

- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds

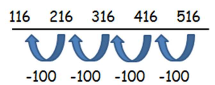
Counting on	Adding near numbers and adjusting
115 + 2 "Put 115 in your head, 116, 117."	433 + 90 = 433 + 100 – 10 = 533 – 10 = 523
Partition number and recombine 127 + 90 = 100 + 20 + 7 + 90 = 100 + 110 + 7 = 100 + 117 = 217	Count on by splitting units to make next multiple of ten/hundred 360 + 80 = 360 + 40 + 40 = 400 + 40 = 440

- *two two-digit numbers (including answer crossing 100)*

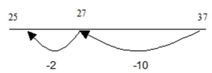
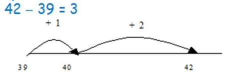
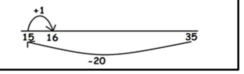
Counting on with number lines	Partition both numbers and recombine
48 + 36 = 84 	27 + 82 = 20 + 7 + 80 + 2 = 100 + 9 = 109
Add the nearest multiple of 10, then adjust 63 + 59 is the same as 63 + 60 - 1	Count on by partitioning the second number only 36 + 93 = 93 + 30 + 6 = 123 + 6 = 129

subtract numbers mentally, including:

- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds

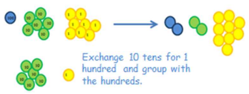
Counting back: 263 - 5	Use unprepared numbered lines to subtract, by counting back:
"Put 263 in your head, 262, 261, 260, 259, 258."	516 – 400 = 116 
Subtract mentally a 'near multiple of 10' to or from a two-digit number: 678 - 90 = 678 - 100 + 10	

- *two two-digit numbers (including answer crossing 100)*

Use known number facts and place value to subtract (partition second number only)	Find a small difference by counting up
37 – 12 = 37 – 10 – 2 = 27 – 2 = 25 	42 – 39 = 3 
	Subtract mentally a number near 10 to or from a two-digit number 35 – 19 = 35 – 20 + 1 

add numbers with up to three digits, using formal written methods of columnar addition (*See Appendix 1*)

Extend mental method of partitioning and recombining.	Vertical expansion
158 + 72 = 100 + (50 + 70) + (8 + 2) = 100 + 120 + 10 = 230	367 +185 12 140 400 552
Column addition 367 +185 552 11	Including money £ 2.50 + £ 1.75 £ 4.25 1



Exchange 10 tens for 1 hundred and group with the hundreds.

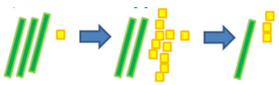
Use base 10 (diennes) or place value counters to support understanding of carrying and to ensure conceptual understanding of place value:

If children are experiencing persistent difficulties, they could use the partitioned column method with carrying (using Diennes for support):

200 + 40 + 6
70 + 6
300 + 20 + 2
100 10

subtract numbers with up to three digits, using formal written methods of columnar subtraction (*See Appendix 1*)

Use base 10 (diennes) as a practical method to introduce exchanging

31 – 18 = 13 

When pupil(s) are confident in doing this practically and verbalizing the calculation, begin to record using partitioned column method:

20 1
~~30~~ + 1
-10 + 8
10 + 3

When secure with exchanging, use partitioned column method to solve calculations involving 3 digit numbers. Repeating the practical stage if necessary.

Introduce Column Subtraction without decomposition:

458
- 232
226

Number – multiplication and division

recall and use multiplication facts for the 3, 4 and 8 multiplication tables

Play games, chant, test etc to increase speed of recalling facts.
Make models and images to display facts.
Investigate patterns within tables.

recall and use division facts for the 3, 4 and 8 multiplication tables

Play games, chant, test etc to increase speed of recalling facts.
Make models and images to display facts.
Investigate patterns within tables.

understand and use mental methods using commutativity and associativity (for example, 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240)

Use a variety of resources (including a calculator) to investigate order of multiplication.
Make models and images to display facts.

understand and use mental methods using multiplication a facts (e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (e.g. 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3)

30 x 5 = 150 50 x 3 = 150 150 ÷ 5 = 30 150 ÷ 3 = 50

3 x 5 = 15 15 ÷ 3 = 5

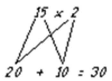
3 x 50 = 150 150 ÷ 30 = 5

5 x 3 = 15 15 ÷ 5 = 3

5 x 30 = 150 50 x 30 = 1500 30 x 50 = 1500 150 ÷ 50 = 3

develop reliable written methods for multiplication, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication

Start by reinforcing mental methods of partitioning:

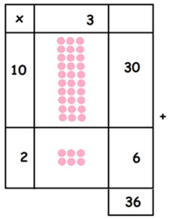
15 x 2 = 30 

13 x 3 = (10 x 3) + (3 x 3)
= 30 + 9
= 39

Grid Method

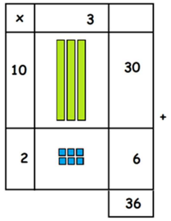
1. Introduce the grid method by linking it to arrays initially (using counters):

12 x 3 = 36



2. Use base 10 (diennes) with grid method to support understanding of place value:

12 x 3 = 36

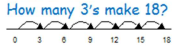


3. Use the grid method:

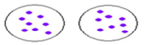
x	3	
10	30	+
3	9	
	39	

develop reliable written methods for division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short division

Use counters and a number line to support pupils understanding,
Number lines
How many 3's make 18?

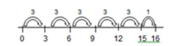


Hoops and dots
16 ÷ 2 = 8

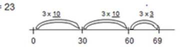


Move on to calculations that leave remainders and/or require tables knowledge:

1) 16 ÷ 3 = 5 r 1

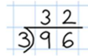


2) 69 ÷ 3 = 23

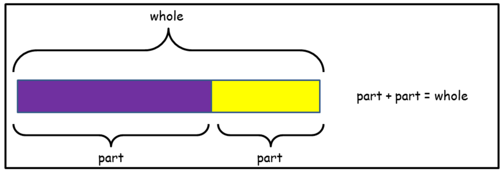
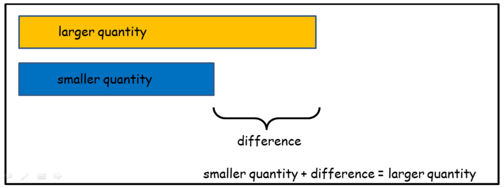
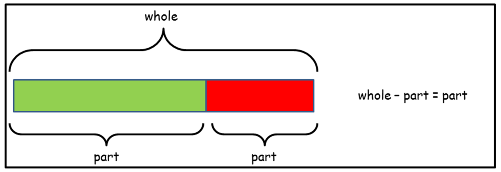
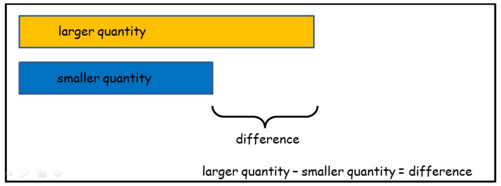
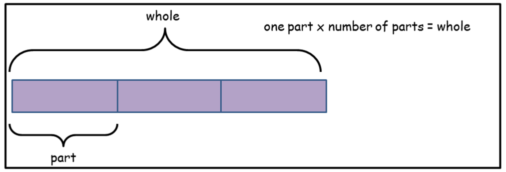
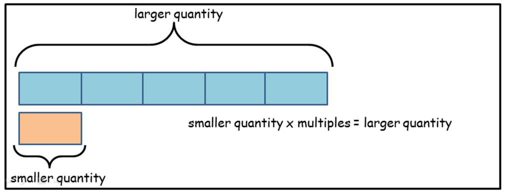
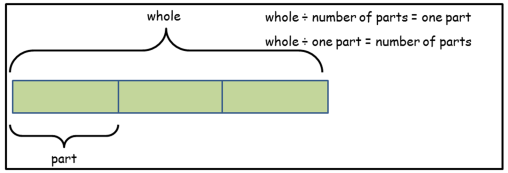
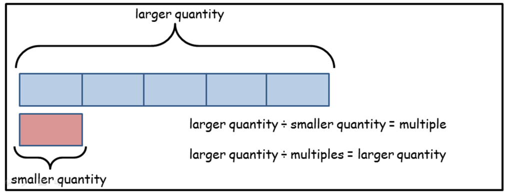


When pupils have had experience with and demonstrated understanding of grouping for division, begin to look at short division with no remainders in the final answer.

Use counters/Dienes to support understanding.



Year 3

Number – addition and subtraction		Number – multiplication and division	
solve problems, including missing number problems, using number facts, place value, and more complex addition Missing numbers should be placed in all possible places: 3 + 4 = = 4 + 3 3 + = 7 7 = + 4 4 + = 7 7 = 3 + + ∇ = 7 7 = + ∇ Use all the models and images mentioned above. Discuss which is most effective and why. Singapore Bar Method  	solve problems, including missing number problems, using number facts, place value, and more complex subtraction Missing numbers should be placed in all possible places: 16 - 9 = = 16 - 9 16 - = 7 7 = - 9 - 9 = 7 7 = 16 - - ∇ = 7 7 = - ∇ Use all the models and images mentioned above. Discuss which is most effective and why. Singapore Bar Method  	solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects *solve simple problems in contexts, deciding which of the four operations to use and why* Missing numbers placed in all possible places. 7 x 2 = = 2 x 7 7 x = 14 14 = x 7 x 2 = 14 14 = 2 x x ∇ = 14 14 = x ∇ Extend to 2 x 6 = 3 x and using three numbers 10 x x = 60 12 = 2 x x 2 Use all the models and images mentioned above. Discuss which is most effective and why. Singapore Bar Method  	solve problems, including missing number problems, involving division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects *solve simple problems in contexts, deciding which of the four operations to use and why* Missing numbers placed in all possible places. 6 ÷ 2 = = 6 ÷ 2 6 ÷ = 3 3 = 6 ÷ ÷ 2 = 3 3 = ÷ 2 ÷ ∇ = 3 3 = ÷ ∇ Extend to 12 ÷ 6 = 8 ÷ and using three numbers 10 ÷ 5 ÷ = 1 3 = 12 ÷ ÷ 2 Use all the models and images mentioned above. Discuss which is most effective and why. Singapore Bar Method  
estimate the answer to a calculation and use inverse operations to check answers Estimate answers before solving any calculation. Once inverse operation has been learnt use as a method for checking.	estimate the answer to a calculation and use inverse operations to check answers Estimate answers before solving any calculation. Once inverse operation has been learnt use as a method for checking.	write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods See models and images above.	write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods See models and images above.
use a variety of language to describe addition +, add, addition, more, plus, make, sum, total, altogether, score, double, near double, one more, two more… ten more… one hundred more, how many more to make…? how many more is… than…? how much more is…? = equals, sign, is the same as tens boundary, hundreds boundary	*use a variety of language to describe subtraction* - subtract, subtraction, take (away), minus, leave, how many are left/left over? one less, two less… ten less… one hundred less, how many fewer is… than…? how much less is…? difference between, half, halve = equals, sign, is the same as	*use a variety of language to describe multiplication* count, count (up) to, count on (from, to), count back (from, to), count in ones, wos, threes, fours, fives… count in tens, hundreds, lots of, groups of, ▯, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times… ten times…times as (big, long, wide… and so on), repeated addition, array, row, column = equals, sign, is the same as	*use a variety of language to describe division* Array, row, column, halve, share, share equally, one each, two each, three each… group in pairs, threes… tens, equal groups of, ÷, divide, division, divided by, divided into, left, left over, remainder = equals, sign, is the same as