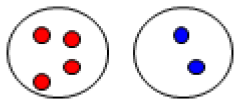
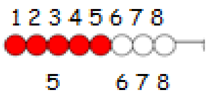
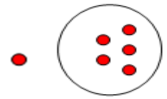
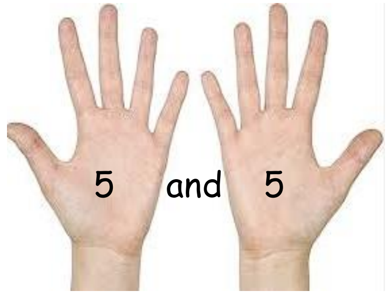
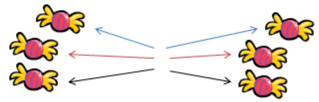
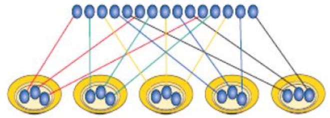
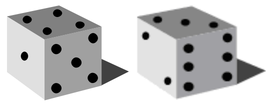
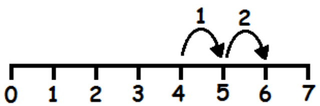
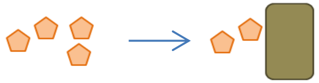
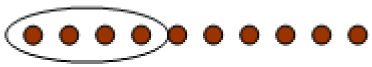
Newton Tony CE VC Primary School	
Calculation Policy	
Policy agreed	September 2023
Policy review	September 2024 or as required

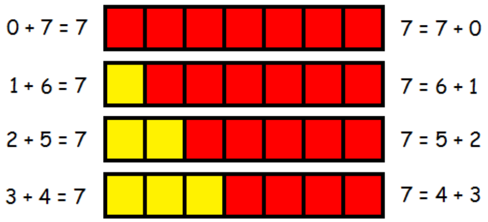
EYFS			
Number – addition and subtraction		**Number – multiplication and division**	
add two single digit numbers aggregation Counters on plates  1, 2, 3, 4, 5, 6. Bead strings or bead bars can be used to illustrate addition including bridging ten by counting on 2 then 3. 5 + 3 = 8 	subtract two single digit numbers reduction Counters on plates  6 take away 1 leaves 1, 2, 3, 4, 5. Cross out drawn objects to represent what has been taken away: 3 take away 2 is 1  Start with 3 … 2, 1.	solve problems including doubling Practically double a group of objects to find double of a number by combining then counting the two groups:  Double 4 is 8.  is 10	solve problems including halving and sharing Sharing objects  One for you. One for me… Is it fair? How many do we each have? 15 shared between 5 is 3.  Grouping objects Put groups of objects on plates. How many groups of 4 are there in 12 stars? 
Count on to find the answer augmentation Practically with objects, fingers etc. 5 + 2 "Put 5 in your head, 6, 7." Dice… *4 + 3 = 7*  *4, 5, 6, 7.* *On a prepared number line (start with the bigger number)…* *2 + 4 = 6* 	Count on or back to find the answer Practically, for example: Group objects on a table then cover some to visualize the calculation: 2 less than 4 is 2  Start with 2… 3, 4. Coins  I had 10 pennies. I spent 4 pence. How much do I have left? Start with 10… 9, 8, 7, 6.		
understand and use vocabulary for addition add, more, and, make, sum, total, altogether, score, double, one more, two more, ten more… how many more to make… ? how many more is… than…? is the same as	*understand and use vocabulary for subtraction* take (away), leave, how many are left/left over? how many have gone? one less, two less… ten less… how many fewer is… than…? difference between is the same as	*understand and use vocabulary for multiplication* count on (from, to), count back (from, to), count in ones, twos… tens… is the same as	*understand and use vocabulary for division* half, halve, count out, share out, left, left over is the same as

Year 1

Number – addition and subtraction

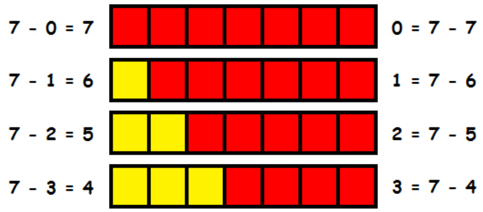
represent and use number bonds up to 20

Start with number bonds to 10 then build. Use a wide range of objects (including fingers!) and images to model the bonds, e.g. interlocking cubes.



represent and use number bond facts related subtraction up to 20

Start with number bonds to 10 then build. Use a wide range of objects (including fingers!) and images to model the bonds, e.g. interlocking cubes.

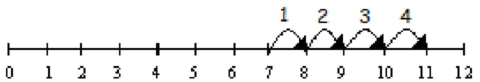


add one-digit and two-digit numbers to 20, including zero

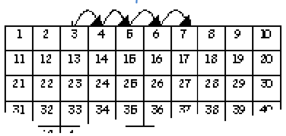
Bead strings or bead bars can be used to illustrate addition including bridging ten by counting on 2 then 3.

8 + 5

On a prepared number line… 7 + 4 = 11



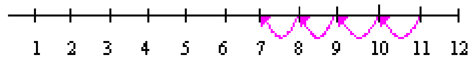
On a hundred square… 3 + 4



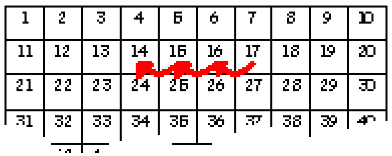
subtract one-digit and two-digit numbers to 20, including zero

Practically with objects, fingers etc.
5 - 2 "Put 5 in your head, 4, 3."

Taking away
Number lines (numbered and unnumbered, prepared and child constructed)



Hundred Square
17 - 3

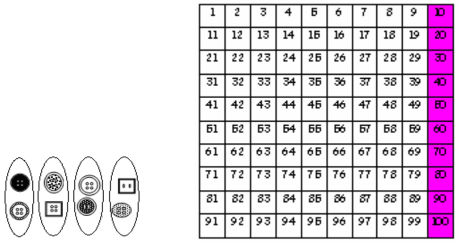


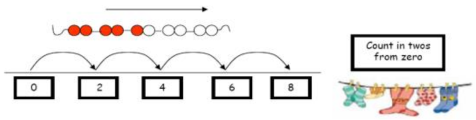
Finding the difference

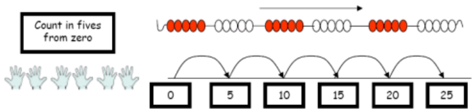
Number – multiplication and division

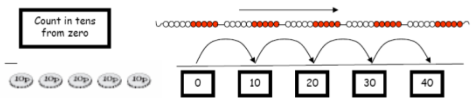
count in multiples of twos, fives and tens (from number and place value)

Counting using a variety of practical resources
Counting in 2s e.g. counting socks, shoes, animals in the ark…
Counting in 10s e.g. hundred square, towers of cubes…









Use rhymes, songs and stories involving counting on and counting back in ones, twos, fives and tens.
Use 2p, 5p and 10p coins.

double numbers and quantities

Practically double a group of objects and/or quantities to find double of a number by combining then counting the two groups.

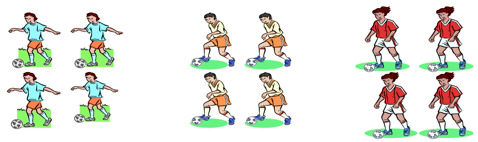
group and share small quantities

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?

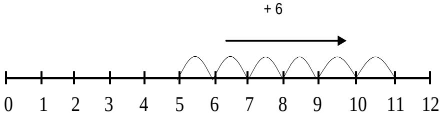
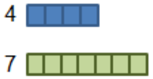
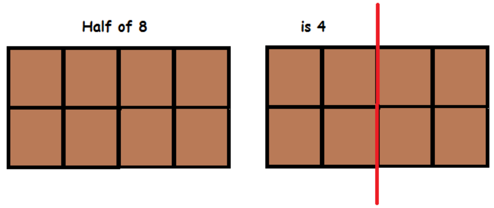
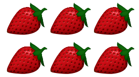
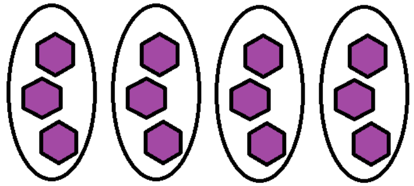
Sharing pictures /objects
12 children get into teams of 4 to play a game. How many teams are there?



Sweets are shared between 2 people. How many do they have each?

half numbers and quantities

Practically halve objects and/or qualities by sharing them out into two piles and then counting the number of objects in each pile, or cutting/folding pictures of objects in half.

	Number lines (numbered and unnumbered, prepared and child constructed)  Use practical equipment (such as numicon or cuisenaire) to identify the 'difference':  'The difference between 7 and 4 is 3' or 'Seven is 3 more than four'.	Progress onto using known facts and counting (in 1s, 2s, 5s and 10s) to double more efficiently.  	Progress onto using known facts and counting (in 1s, 2s, 5s and 10s) to halve more efficiently. 
read, write and interpret mathematical statements involving addition (+) and equals (=) signs It is important to that children have a clear understanding of the concept of equality, before using the '=' sign. Calculations should be on either side of the '=' to that children don't misunderstand '=' as to mean 'the answer'. 15 + 2 = 17 15 = 3 + 12	read, write and interpret mathematical statements involving and subtraction (-) equals (=) signs It is important to that children have a clear understanding of the concept of equality, before using the '=' sign. Calculations should be on either side of the '=' to that children don't misunderstand '=' as to mean 'the answer'. 15 - 2 = 13 15 = 18 - 3	*make connections between arrays and number patterns* Arrays  Looking at columns 2 + 2 + 2 3 groups of 2 Looking at rows 3 + 3 2 groups of 3 Arrays and repeated addition  4 x 2 or 4 + 4 2 x 4 or 2 + 2 + 2 + 2	*make connections between arrays and number patterns*  There are 4 groups of 3 in 12. 12 shared between 4 is 3.
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = [] + 4 To support this, when solving calculations, 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.	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = []- 9 To support this, when solving calculations, 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.	solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support Use all the models and images mentioned above. Discuss which is most effective and why.	solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support Use all the models and images mentioned above. Discuss which is most effective and why.
understand and use vocabulary for addition, e.g. put together, add, altogether, total and more than	*understand and use vocabulary for addition and subtraction, e.g. take away, distance between, difference between and less than*	*use a variety of language to describe multiplication* count on (from, to), count back (from, to), count in ones, twos, threes, fours, fives… count in tens,	*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

+, add, more, plus, make, total, altogether, score, double, near double, one more, two more… ten more, = equals, sign, is the same as How many more to make…? How many more is… than…? How much more is…? Repetition of facts with different vocabulary: "What is 2 add 5?" "What is 2 more than 5?" "What is 2 plus 5?" What is the total of 2 and 5?" etc	- subtract, take (away), minus, leave, how many are left/left over? how many have gone? one less, two less, ten less… how many fewer is… than…? how much less is…? difference between, half, halve, counting up/back… = equals, sign, is the same as Repetition of facts with different vocabulary: "What is 7 take away 3?" "What is 3 less than 7?" "What is 7 subtract 3?" "What is the difference between 3 and 7?" etc	lots of, groups of, x, times, multiply, multiplied by, multiple of, once, twice, three times… ten times… times as (big, long, wide… and so on), repeated addition, array, row, column, double, halve = equals, sign, is the same as	÷, divide, divided by, divided into, left, left over = equals, sign, is the same as

<table>
<tr><th colspan="4">Year 2</th></tr>
<tr><th colspan="2">Number – addition and subtraction</th><th colspan="2">Number – multiplication and division</th></tr>
<tr>
<td>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
Play games, chant, test etc to increase speed of recalling facts to 20.
Make models and images to display facts.
Investigate related facts to 100 and repeat above.</td>
<td>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
Play games, chant, test etc to increase speed of recalling facts to 20.
Make models and images to display facts.
Investigate related facts to 100 and repeat above.</td>
<td>recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
Play games, chant, test etc to increase speed of recalling facts to 20.
Make models and images to display facts.
Investigate related facts to 100 and repeat above.</td>
<td>recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
Play games, chant, test etc to increase speed of recalling facts to 20.
Make models and images to display facts.
Investigate related facts to 100 and repeat above.</td>
</tr>
<tr>
<td>add numbers using concrete objects, pictorial representations, and mentally, including:
a two-digit number and ones or tens</td>
<td>subtract numbers using concrete objects, pictorial representations, and mentally, including:
a two-digit number and ones or tens</td>
<td>connect the 10 multiplication table to place value<table><tr><th>H</th><th>T</th><th>U</th></tr><tr><td></td><td>1</td><td>0</td></tr><tr><td></td><td>2</td><td>0</td></tr><tr><td></td><td>3</td><td>0</td></tr><tr><td></td><td>4</td><td>0</td></tr></table></td>
<td>connect the 10 multiplication table to place value<table><tr><th>H</th><th>T</th><th>U</th></tr><tr><td></td><td>1</td><td>0</td></tr><tr><td></td><td>2</td><td>0</td></tr><tr><td></td><td>3</td><td>0</td></tr><tr><td></td><td>4</td><td>0</td></tr></table></td>
</tr>
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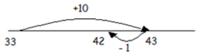
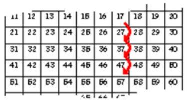
Counting on
15 + 2 "Put 15 in your head, 16, 17."

Adding near numbers and adjusting
33 + 9 = 33 +10 -1



Partition number and recombine
27 + 9 = 20 + 7 + 9
= 20 + 16
= 36

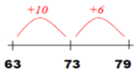
Hundred Square
17 + 30



Count on by splitting units to make next multiple of ten
36 + 8 = 36 + 4 + 4
= 40 + 4
= 44

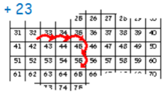
- two two-digit numbers

Use empty number lines to add two 2 digits numbers, by counting on in multiples of ten then multiples of one.
63 + 16 = 79

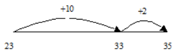


Partition into tens and ones and recombine
12 + 23 = 10 + 2 + 20 + 3
= 10 + 20 + 2 + 3
= 30 + 5
= 35

Hundred Square
32 + 23



Refine to partitioning the second number only:
23 + 12 = 23 + 10 + 2
= 33 + 2
= 35

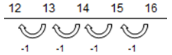


- adding three one-digit numbers

Use knowledge of adding, for example number bonds first or largest numbers first.
3 + 9 + 7 = (3 +7) + 9
= 10 + 9
= 19

Counting back
63 - 20 "Put 63 in your head, 53, 43."

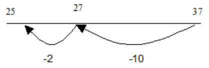
Use unprepared numbered lines to subtract, by counting back in units:
16 – 4 = 12



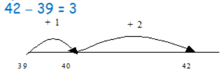
Hundred Square
43 - 30

- two two-digit numbers

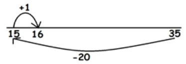
Use known number facts and place value to subtract (partition second number only)
37 – 12 = 37 – 10 – 2
= 27 – 2
= 25



Find a small difference by counting up
42 – 39 = 3



Subtract mentally a number near 10 to or from a two-digit number
35 – 19 = 35 – 20 + 1



relate multiplication to arrays and to repeated addition using a range of materials and contexts

Practically combine groups of objects (2s, 5s and 10s) and verbalise (then record) what has been found out:
There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? 2 add 2 add 2 equals 6

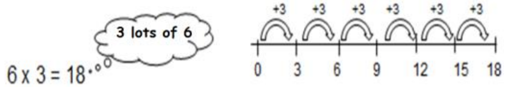
Mum washed 5 pairs of socks, how many socks did she get out of the washing machine? 2 + 2 + 2 + 2 + 2 = 10

Use arrays for repeated addition and relate this to the x calculation:
(Use counters or objects as well as visual representations to support understanding)

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

5 x 3 = 15
3 x 5 = 15

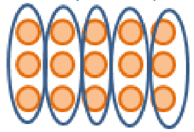
Use a number line for repeated addition:



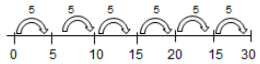
relate division to grouping and sharing discrete and continuous quantities, to arrays and to repeated subtraction using a range of materials and contexts

Initially, pupils to practically 'share' and 'group' using practical equipment and pictorial representation. Move on to using arrays to identify groups, use physical counters before pictorial representations:

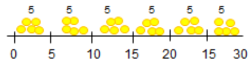
How many groups of 3 are in 15?



Grouping using a number line:
There are 30 children in the class, how many groups of 5 can we get into?



Use counters to support pupils understanding:



check their calculations, including adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5) - establishing commutativity and associativity of addition
See models and images.

check their calculations, including by adding to check subtraction
See models and images

recognise and use the inverse relationship between addition and subtraction and use this to check calculations
See models and images.

recognise and use the inverse relationship between addition and subtraction and use this to check calculations
See models and images.

use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4)

Arrays – related facts

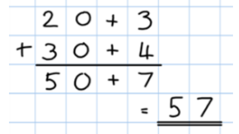
3 x 5 = 15
5 x 3 = 15

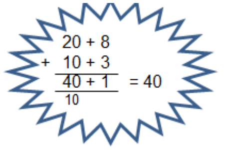
15 ÷ 3 = 5
15 ÷ 5 = 3

record addition and subtraction in columns

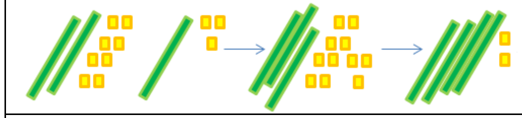
Use partitioned column method.

Solve calculations that do not cross the tens boundary, until they are secure with the method. Then solve calculations that do cross the tens boundary. Use base 10 (diennes) to support the understanding of 'carrying' and the value of 'digits'.





28 + 13



---

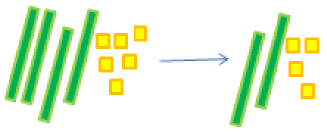
record subtraction in columns

Introduce partitioned column method where no exchanging is required:

46 – 22 = 24

	40 + 6
-	20 + 2
	20 + 4

use base 10 (diennes) to support understanding



---

calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs

3 x 4 = 12

Repetition of sentence with different vocabulary:

"3 times 4 equals 12"

"3 lots of 4 are 12"

"3 multiplied by 4 equals 12"

"The product of 3 and 4 is 12"

---

calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs

12 ÷ 4 = 3

Repetition of sentence with different vocabulary:

"12 divided by 4 equals 3"

"12 shared by 4 is 3"

"12 grouped into 4s is 3"

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solve problems with addition:

- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying increasing knowledge of mental and written methods

Use all the models and images mentioned above. Discuss which is most effective and why.

---

solve problems with subtraction:

- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  applying increasing knowledge of mental and written methods

Use all the models and images mentioned above. Discuss which is most effective and why.

---

solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts

Use all the models and images mentioned above. Discuss which is most effective and why.

---

solve problems involving division, using materials, arrays, repeated addition, mental methods, and division facts, including problems in contexts

Use all the models and images mentioned above. Discuss which is most effective and why.

---

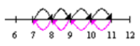
recognise and use the inverse relationship between addition and subtraction and use this to solve missing number problems

Missing numbers placed in all possible places.

7 - 3 = □	□ = 4 + 3
7 - □ = 4	7 = □ + 3
□ - 3 = 4	7 = 4 + □
□ - ∇ = 4	7 = □ + ∇

Number lines

7 + 4 = 11 11 – 4 = 7



As Year 1 and extend to

14 + 5 = 10 + □
17 - 5 = 14 - □

and three numbers

32 + □ + □ = 100
35 = 46 - □ - 7

---

recognise and use the inverse relationship between multiplication and division and use this to solve missing number problems

3 x 5 = 15

5 x 3 = 15

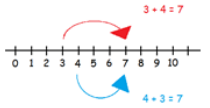
15 ÷ 3 = 5

15 ÷ 5 = 3

---

show that addition of two numbers can be done in any order (commutative)

On a number line



26 + 12 = 38

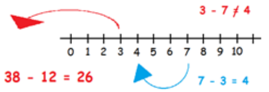
On a hundred square

12 + 26 = 38

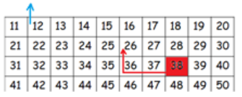
---

show that subtraction of two numbers cannot be done in any order

On a number line



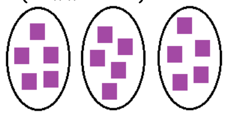
12 - 38 ≠ 26 38 - 12 = 26



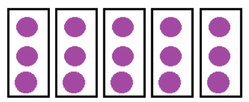
On a hundred square

---

show that multiplication of two numbers can be done in any order (commutative)



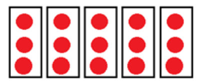
5 x 3 = 15



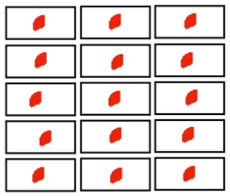
3 x 5 = 15

---

show that division of one number by another cannot be done in any order



15 ÷ 5 = 3



5 ÷ 15 ≠ 3

---

extend their understanding of the language of addition to include sum

---

extend their understanding of the language of subtraction to include difference

---

use a variety of language to describe multiplication

---

use a variety of language to describe division

+, add, more, plus, make, sum, total, altogether, score, double, near double, one more, two more… ten more, How many more to make…? How many more is… than…? How much more is…? Repetition of facts with different vocabulary: "What is 2 add 5?" "What is 2 more than 5?" "What is 2 plus 5?" What is the total of 2 and 5?" etc = equals, sign, is the same as	- 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, tens boundary 13 + 5 = 8 Repetition of sentence with different vocabulary: "13 subtract 5 equals 8" "5 less than 13 is 8 "13 take away 5 equals 8" "The difference between 13 and 5 is 8" etc = equals, sign, is the same as	count on (from, to), count back (from, to), count in ones, twos, threes, fours, fives… count in tens, lots of, groups of, x, times, multiply, multiplied by, multiple of, once, twice, three times… ten times… times as (big, long, wide… and so on), repeated addition, array, row, column, double, halve = equals, sign, is the same as	Array, row, column, halve, share, share equally, one each, two each, three each… group in pairs, threes… tens, equal groups of, ÷, divide, divided by, divided into, left, left over = equals, sign, is the same as

Year 3

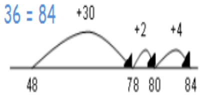
Number – addition and subtraction

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)*

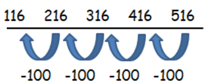
Counting on with number lines	Partition both numbers and recombine
48 + 36 = 84 	27 + 82 = 20 + 7 + 80 + 2 = 100 + 9 = 109
Add the nearest multiple of 10, then adjust 63 + 59 is the same as 63 + 60 - 1	**Count on by partitioning the second number only** 36 + 93 = 93 + 30 + 6 = 123 + 6 = 129

estimate the answer to a calculation and use inverse operations to check answers

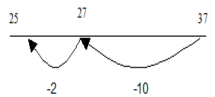
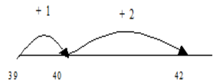
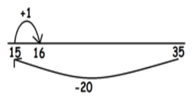
Estimate answers before solving any calculation.
Once inverse operation has been learnt use as a method for checking.

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 

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.

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.

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.

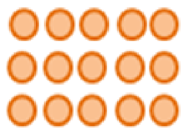
recall and use division facts for the 3, 4 and 8 multiplication tables

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 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 × 5 = 150　　50 × 3 = 150　　150 ÷ 5 = 30　　150 ÷ 3 = 50

3 × 5 = 15　　15 ÷ 3 = 5



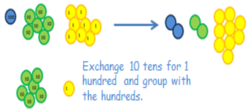
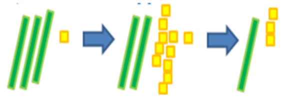
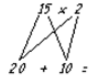
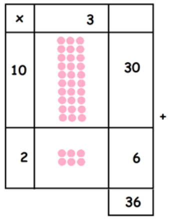
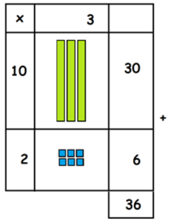
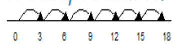
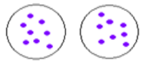
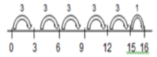
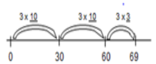
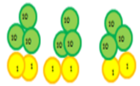
3 × 50 = 150　　150 ÷ 30 = 5

5 × 3 = 15　　15 ÷ 5 = 3

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

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

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.	See models and images.
add numbers with up to three digits, using formal written methods of columnar addition (*See Appendix 1*) Extend mental method of partitioning and recombining. 158 + 72 = 100 + (50 + 70) + (8 + 2) = 100 + 120 + 10 = 230 Vertical expansion 367 +185 12 140 400 552 Column addition 367 +185 552 11 Including money £ 2.50 + £ 1.75 £ 4.25 1  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 *When exchanging refer to the process as 're-grouping'	*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/Diennes to support understanding.  32 3)96
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.	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.	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.	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.
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, re-grouping = 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

Year 4

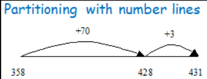
Number – addition and subtraction

add numbers mentally, including:

- *a four-digit number and ones*
- *a four-digit number and tens*
- *a four-digit number and hundreds*
- *a four-digit number and thousands*

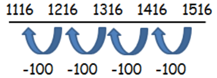
Counting on 3115 + 2 "Put 3115 in your head, 3116, 3117."	Adding near numbers and adjusting 7433 + 90 = 7433 + 100 - 10 = 7533 - 10 = 7523
Partition number and recombine 5127 + 2000 = 5000 + 100 + 20 + 7 + 2000 = 7000 + 100 + 20 + 7 = 7127	Count on by splitting units to make next multiple of ten/hundred 2360 + 500 = 2360 + 400 + 40 + 60 = 2400 + 400 + 60 = 2860

- *three and two-digit numbers*

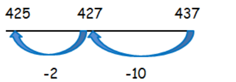
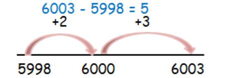
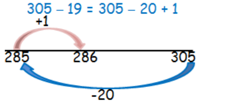
Partition both numbers into hundreds, tens and ones and recombine 358 + 73 = 300 + 50 + 8 + 70 + 3 = 300 + 120 + 11 = 420 + 11 = 431	Partition second number only into hundreds, tens and ones and recombine 358 + 73 = 358 + 70 + 3 = 428 + 3 = 431
Partitioning with number lines 	Add the nearest multiple of 10 or 100, then adjust 458 + 79 = 458 + 80 - 1

subtract numbers mentally, including:

- *a four-digit number and ones*
- *a four-digit number and tens*
- *a four-digit number and hundreds*
- *a four-digit number and thousands*

Counting back: 5263 - 5 "Put 5263 in your head, 5262, 5261, 5260, 5259, 5258."	Use unprepared numbered lines to subtract, by counting back: 1516 – 400 = 1116 
Subtract mentally a 'near multiple of 10' to or from a two-digit number: 3678 - 90 = 3678 - 100 + 10	

- *three and two-digit numbers*

Use known number facts and place value to subtract (partition second number only) 437 – 12 = 437 – 10 – 2 = 427 – 2 = 425 	Find a small difference by counting up 6003 - 5998 = 5 
	Subtract mentally a number near 10 to or from a two-digit number 305 – 19 = 305 – 20 + 1 

Number – multiplication and division

recall multiplication facts for multiplication tables up to 12 × 12

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

use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers
practise and extend mental methods to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6)

Use knowledge of multiplication facts and place value to derive related facts.

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

Partition

$$18 \times 9 = (10 \times 9) + (8 \times 9)$$
$$= 90 + 72$$
$$= 162$$

recall division facts for multiplication tables up to 12 × 12

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

use place value, known and derived facts to divide mentally, including: dividing by 1 *practise and extend mental methods to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6)*

Use knowledge of multiplication facts and place value to derive related facts.

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

Partitioning/Chunking

$$77 \div 5 = (50 \div 5) + (25 \div 5) + (\text{remainder } 2)$$
$$= 10 + 5 + (\text{remainder } 2)$$
$$= 15 \text{ remainder } 2$$

<table>
<tr>
<td></td>
<td></td>
<td>recognise and use commutativity in mental calculations
write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law
(2 × 3) × 4 = 2 × (3 × 4))

Use a variety of resources (including a calculator) to investigate order of multiplication. Make models and images to display facts.</td>
<td>recognise and use factor pairs in mental calculations

Use a variety of resources (including a calculator) to investigate factor pairs. Make models and images to display facts.</td>
</tr>
<tr>
<td>add numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate (see Appendix 1)

Column addition
2358
+ 373
2731
1 1

To ensure conceptual understanding, it is essential that place value is reinforced by frequently.
Discussing the actual value of each digit, e.g. the 5 digit represents 5 hundreds.

Use base 10 (Diennes) or place value counters to support understanding of carrying and to ensure conceptual understanding of place value (see year 2 and 3 for how to use these manipulatives).

Including decimals
72.8
+ 54.6
127.4
1

To ensure conceptual understanding, it is essential that place value is reinforced by frequently discussing the actual value of each digit, e.g. the 2 digit represents 2 tens.

Use money to support understanding.</td>
<td>subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate (see Appendix 1)

Revision of partitioned column method from Year 3. Moving on to numbers with 4 digits: (use Diennes to support when required.)
2754 − 1562 = 1192
2000 + $\cancel{700}$ 600 + ¹50 + 4
− 1000 + 500 + 60 + 2
1000 + 100 + 90 + 2

Column Subtraction without decomposition
458
- 232
226

Column Subtraction with decomposition
Once pupils are confident in exchanging and have a clear understanding of place value, move towards the formal compact column method: (use Diennes to support when required.)
2 $\cancel{7}$⁶ ¹5 4
− 1 5 6 2
1 1 9 2

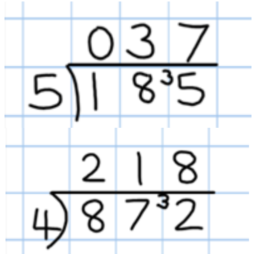
*When exchanging refer to the process as 're-grouping'</td>
<td>multiply two-digit and three-digit numbers by a one-digit number using formal written layout (see Appendix 1)

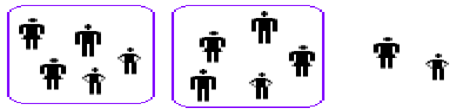
Grid method
231 x 7 is approximately 200 x 10 = 2000

231 × 7 = 1617
<table>
<tr><td>×</td><td>7</td></tr>
<tr><td>200</td><td>1400</td></tr>
<tr><td>30</td><td>210 +</td></tr>
<tr><td>1</td><td>7</td></tr>
<tr><td></td><td>1617</td></tr>
</table>

move onto formal method of short multiplication when proficient

452
X 3
1356
1</td>
<td>divide numbers up to 3 digit by a one-digit number using the formal written method of short division and begin to interpret remainders.

Short division with no remainders in the final answer, use place value counters/Diennes where support is required.

Remainders
Begin to interpret remainders by looking at word problems to give context and small numbers to start with.

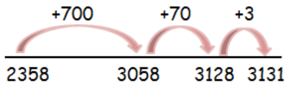
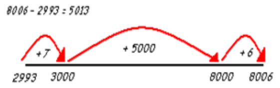
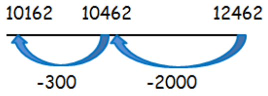
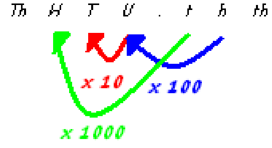
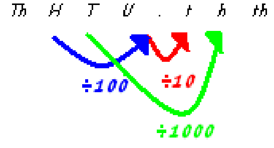
Cars carry 5 people. !2 people are going on a trip. How many cars will they need?

12 ÷ 5 = 2 r 2 So they would need 3 cars.

5 buttons are packed in a bag. How many full bags would there be if there were 12 buttons?

12 ÷ 5 = 2 r 2. So there are 2 full bags.</td>
</tr>
</table>

solve addition two-step problems in contexts, deciding which operations and methods to use and why Use all the models and images mentioned above. Discuss which is most effective and why.	solve subtraction two-step problems in contexts, deciding which operations and methods to use and why Use all the models and images mentioned above. Discuss which is most effective and why.	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects *solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers* Use all the models and images mentioned above. Discuss which is most effective and why.	*solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers* Use all the models and images mentioned above. Discuss which is most effective and why.
estimate and use inverse operations to check answers to a calculation Estimate answers before solving any calculation. Once inverse operation has been learnt use as a method for checking.	estimate and use inverse operations to check answers to a calculation Estimate answers before solving any calculation. Once inverse operation has been learnt use as a method for checking.	*estimate and use inverse operations to check answers to a calculation* Estimate answers before solving any calculation. Once inverse operation has been learnt use as a method for checking.	*estimate and use inverse operations to check answers to a calculation* Estimate answers before solving any calculation. Once inverse operation has been learnt use as a method for checking.
use a variety of language to describe addition + add, addition, more, plus, increase, sum, total, altogether, score, double, near double, how many more to make…? tens boundary, hundreds boundary, inverse = equals, sign, is the same as	*use a variety of language to describe subtraction* - subtract, subtraction, take (away), minus, decrease, leave, how many are left/left over? difference between, half, halve, how many more/fewer is… than…? how much more/less is…? tens boundary, hundreds boundary, inverse, re-grouping = equals, sign, is the same as	*use a variety of language to describe multiplication* 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, double, inverse = 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, remainder, factor, quotient, divisible by, inverse = equals, sign, is the same as

Year 5			
Number – addition and subtraction		**Number – multiplication and division**	
add numbers mentally with increasingly large numbers (*e.g. 12 462 – 2300 = 10 162*)	subtract numbers mentally with increasingly large numbers (*e.g. 12 462 – 2300 = 10 162*)	multiply numbers mentally drawing upon known facts *Partition* *47 x 6 = (40 x 6) + (7 x 6)* *= (240) + (42)* *= 282* *Double and halve* *25 x 16 = 50 x 8 = 100 x 4 = 200 x 2 = 400*	divide numbers mentally drawing upon known facts Partitioning 72 ÷ 3 = (60 ÷ 3) = (12 ÷ 3) = 20 + 4 = 24
		multiply whole numbers and those involving decimals by 10, 100 and 1000 Place Value	divide whole numbers and those involving decimals by 10, 100 and 1000 Place Value

Partition both numbers and recombine 2358 + 773 = 2000 + 300 + 50 + 8 + 700 +70 + 3 = 2000 + 1000 + 120 + 11 = 3000 + 100 + 30 + 1 =3131 Partitioning with number lines  Partition second number only into hundreds, tens and ones and recombine 2358 + 773 = 2358 + 700 + 70 + 3 = 3058 + 70 + 3 = 3128 + 3 = 3131 Add the nearest multiple of 10 or 100, then adjust 458 + 79 = 458 + 80 - 1	Subtract the nearest multiple of 10 or 100, then adjust 458 - 79 = 458 - 80 + 1 = 378 + 1 = 379 Find a difference by counting up  Use known number facts and place value to subtract (partition second number only) 12 462 - 2300 = 12 462 - 2000 - 300 = 10 462 - 300 = 10 162 		
		identify multiples, (*and use them to construct equivalence statements, e.g. 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 9² x 10)* Use a variety of resources (including a calculator) to investigate multiples. Make models and images to display facts.	identify factors, including finding all factor pairs of a number, and common factors of two numbers (*and use them to construct equivalence statements, e.g. 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 9² x 10*) Use a variety of resources (including a calculator) to investigate factors. Make models and images to display facts.
		recall prime numbers up to 19 establish whether a number up to 100 is prime Play games, chant, test etc to increase speed of recalling facts. Make models and images to display facts. Investigate patterns within primes.	recall prime numbers up to 19 establish whether a number up to 100 is prime Play games, chant, test etc to increase speed of recalling facts. Make models and images to display facts. Investigate patterns within primes.
		recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) Use a variety of resources (including a calculator) to investigate square and cubed numbers. Make models and images to display facts. Investigate the patterns within squared and cubed numbers.	
add numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction – *see Appendix 1*)	subtract numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction – *see Appendix 1*)	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context (*as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 98/4 = 24 r 2 = 24 ½ = 24.5 ≈ 25)*)

Column addition 124.90 (add in a zero to keep + 117.25 the place value) 242.15 11 To ensure conceptual understanding, it is essential that place value is reinforced by frequently. Discuss the value of each digit. Use base 10 (Diennes) to support understanding of exchanging and to ensure conceptual understanding of place value. Where there is an 'empty' space in a decimal column, pupils should insert a zero to show the value. Children should be made aware that it is essential to align the columns carefully. Pupils should be able to add more than 2 numbers using the compact column method. 3.25 + 4.13 0.76 8.14 1 1	Revision of **formal compact column method** extending to calculations involving numbers with more than 4 digits (use Diennes to support understanding of decomposition and place value). − 2 1 2 8 2 8,9 2 8 When confident in using **formal compact column method** with integers and decimals involving money (always 2 decimal places), extend to subtraction with mixtures of integers and decimals. A clear understanding of place value is essential. Align the decimal point and use '***place holders***', if needed. − 263.0 26.5 236.5 Use Diennes or place value counters (add counters with 0.1) to support understanding of decomposition and place value. *When exchanging refer to the process as 're-grouping'	Review formal method of short multiplication (for multiplying by one digit numbers) when proficient 452 × 3 = 1356 1243 × 8 = 9624 Start with grid method when multiplying by 2 digit numbers 72 x 38 is approximately 70 x 40 = 2800 x | 70 | 2 30 | 2100 | 60 8 | 560 | 16 2160 + 576 = 2736 Move onto formal long multiplication 34 X 13 102 340 442 Then formal multiplication with more complex numbers: 1234 × 16 7404 12340 19,744	Bus shelter method (short division) 5 | 4 3 2 = 8 6 r 2 4 | 457.00 = 114.25 Pupils should consider whether remainders should be left as a reminder, rounded to the nearest whole or converted into a decimal or fraction. Introduce long division (dividing by single digits) 256 ÷ 7 lies between 210 ÷ 7 = 30 and 280 ÷ 7 = 40 256 - 70 (10 groups) or (10 x 7) 186 140 (20 groups) or (20 x 7) 46 - 42 (6 groups) or (6 x 7) 4 (36 groups) or (36) Answer: 36 remainder 4
solve addition multi-step problems in contexts, deciding which operations and methods to use and why Use all the models and images mentioned above. Discuss which is most effective and why.	solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why Use all the models and images mentioned above. Discuss which is most effective and why.	*Solve problems that use multiplication and division as inverses, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres* Use all the models and images mentioned above. Discuss which is most effective and why. *use and explain the equals sign to indicate equivalence, including missing number problems (e.g, 13+24 = 12+25; 33 = 5 x [])* *express distributivity, for example as a(b + c) = ab + ac* Use all of the models and images above to investigate a range of statements, ensuring the equals sign is in different positions. Allow time for discussion and reasoning. Display solutions and reasoning. Also use errors or misconceptions as a starting point.	*Solve problems that use multiplication and division as inverses, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres* Use all the models and images mentioned above. Discuss which is most effective and why. *use and explain the equals sign to indicate equivalence, including missing number problems (e.g, 13+24 = 12+25; 33 = 5 x [])* Use all of the models and images above to investigate a range of statements, ensuring the equals sign is in different positions. Allow time for discussion and reasoning. Display solutions and reasoning. Also use errors or misconceptions as a starting point.
use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).

<table>
<tr>
<td>use a variety of language to describe addition

+ add, addition, more, plus, increase, sum, total, altogether, score, double, near double, how many more to make…? tens boundary, hundreds boundary, units boundary, tenths boundary, inverse

= equals, sign, is the same as</td>
<td>use a variety of language to describe subtraction

- subtract, subtraction, take (away), minus, decrease, leave, how many are left/left over? difference between, half, halve, how many more/fewer is… than…? how much more/less is…? tens boundary, hundreds boundary, units boundary, tenths boundary, inverse, re-grouping

= equals, sign, is the same as</td>
<td>use a variety of language to describe multiplication
know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
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, double,, inverse, prime,
equals, sign, is the same as</td>
<td>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, remainder, factor, quotient, divisible by, inverse. Prime, factors

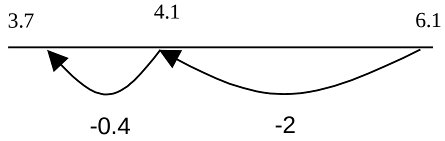
equals, sign, is the same as</td>
</tr>
</table>

<table>
<tr><th colspan="4">Year 6</th></tr>
<tr><th colspan="2">Number – addition and subtraction</th><th colspan="2">Number – multiplication and division</th></tr>
<tr>
<td rowspan="2">perform mental calculations, including with mixed operations and large numbers (and decimals)

Partition both numbers into hundreds, tens, ones and decimal fractions and recombine
35.8 + 7.3 = 30 + 5 + 0.8 + 7 + 0.3
= 30 + 12 + 1.1
= 42 + 1.1
= 43.1

Partition second number only into hundreds, tens, ones and decimal fractions and recombine
35.8 + 7.3 = 35.8 + 7 + 0.3
= 42.8 + 0.3
= 43.1

Add the nearest whole number then adjust
52 + 11.9 = 52 + 12 – 0.1
= 64 – 0.1
= 63.9</td>
<td rowspan="2">perform mental calculations, including with mixed operations and large numbers(and decimals)

Use known number facts and place value to subtract
6.1 – 2.4 = 3.7


Subtract the nearest whole number then adjust
52 - 11.9 = 52 - 12 + 0.1
= 40 + 0.1
= 40.1</td>
<td>perform mental calculations, including with mixed operations and large numbers(and decimals)

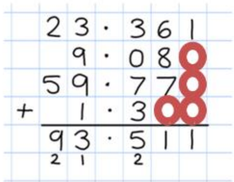
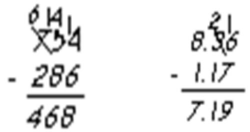
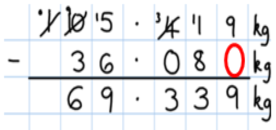
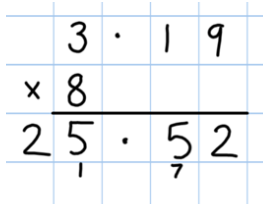
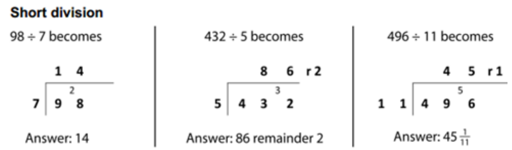
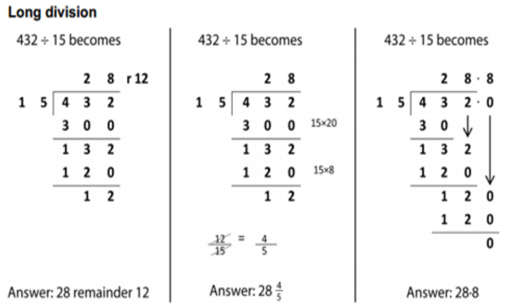
Partitioning
4.7 x 6 = (4 x 6) + (0.7 x 6)
= (24) + (4.2)
= 28.2

Double and halve
4.25 x 32 = 8.5 x 16
= 17 x 8
= 34 x 4
= 68 x 2
= 136</td>
<td>perform mental calculations, including with mixed operations and large numbers(and decimals)

Partitioning
7.2 ÷ 3 = (6 ÷ 3) = (1.2 ÷ 3)
= 2 + 0.4
= 2.4</td>
</tr>
<tr>
<td>identify common factors, common multiples and prime numbers

Use a variety of resources (including a calculator) to investigate common factors, common multiples and prime numbers. Make models and images to display facts. Investigate the patterns within the numbers.</td>
<td>identify common factors, common multiples and prime numbers

Use a variety of resources (including a calculator) to investigate common factors, common multiples and prime numbers. Make models and images to display facts. Investigate the patterns within the numbers.</td>
</tr>
</table>

practise addition for larger numbers, using the formal written methods of columnar addition (see Appendix 1) Extend the use of compact column method to adding several numbers with mixed decimals.  Children should be reminded of the importance of aligning the columns accurately. Where there is an 'empty' space in a decimal column, pupils could insert a zero to show the value.	*practise subtraction for larger numbers, using the formal written methods of columnar subtraction (see Appendix 1)* Column Subtraction with decomposition  Including decimals Revision of formal compact column method extending to more complex integers and applying to problem solving using money and measures, including decimals with different numbers of decimal places. Align the decimal point when setting out calculations. Use *'place holders'* to aid understanding of the value in that column. 	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of short and long multiplication (*Appendix 1*) Short multiplication and Long multiplication as in Year 5, but apply to numbers with decimals.  Pupils may need reminding that single digits belong in the ones (units) column. A sound understanding of place value and the formal method itself are required before progressing to decimal multiplication.	divide numbers up to 4 digits by a two-digit whole number using the formal written method of short and long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context (*Appendix 1*) Short division  Long division (for dividing by 2 digits)  **Remainders: Quotients expressed as fractions or decimal fractions 61 ÷ 4 = 15 $\frac{1}{4}$ or 15.25**
solve addition multi-step problems in contexts, deciding which operations and methods to use and why Use all the models and images mentioned above. Discuss which is most effective and why.	solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why Use all the models and images mentioned above. Discuss which is most effective and why.	solve problems involving multiplication Use all the models and images mentioned above. Discuss which is most effective and why.	solve problems involving division Use all the models and images mentioned above. Discuss which is most effective and why.
round answers to a specified degree of accuracy, e.g. to the nearest 10, 20, 50 etc., but not to a specified number of significant figures Use knowledge of rounding (see fraction Policy) to create estimates.	*round answers to a specified degree of accuracy, e.g. to the nearest 10, 20, 50 etc., but not to a specified number of significant figures* Use knowledge of rounding (see fraction Policy) to create estimates.	*round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., (not to specified number of significant figures)* Use knowledge of rounding (see fraction Policy) to create estimates.	*round answers to a specified degree of accuracy, e.g. to the nearest 10, 20, 50 etc., but not to a specified number of significant figures* Use knowledge of rounding (see fraction Policy) to create estimates.
use their knowledge of the order of operations to carry out calculations involving the four operations *explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9*	use their knowledge of the order of operations to carry out calculations involving the four operations *explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9*	use their knowledge of the order of operations to carry out calculations involving the four operations *explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9*	use their knowledge of the order of operations to carry out calculations involving the four operations *explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9*

Review and investigate the effect of carrying out operations in different orders. Explore the effect. Introduce and use BODMAS to solve calculations.	Review and investigate the effect of carrying out operations in different orders. Explore the effect. Introduce and use BODMAS to solve calculations.	Review and investigate the effect of carrying out operations in different orders. Explore the effect. Introduce and use BODMAS to solve calculations.	Review and investigate the effect of carrying out operations in different orders. Explore the effect. Introduce and use BODMAS to solve calculations.
use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy Estimate answers before solving any calculation. Check against estimate after calculating (and use inverse check).
use a variety of language to describe subtraction + add, addition, more, plus, increase, sum, total, altogether, score, double, near double, how many more to make…? tens boundary, hundreds boundary, units boundary, tenths boundary, inverse = equals, sign, is the same as	*use a variety of language to describe subtraction* - subtract, subtraction, take (away), minus, decrease, leave, how many are left/left over? difference between, half, halve, how many more/fewer is… than…? how much more/less is…? tens boundary, hundreds boundary, units boundary, tenths boundary, re-grouping, inverse = equals, sign, is the same as	*use a variety of language to describe subtraction* x 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 double, inverse = equals, sign, is the same as	*use a variety of language to describe subtraction* 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, remainder, factor, quotient, divisible by, inverse = equals, sign, is the same as