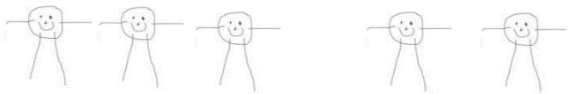
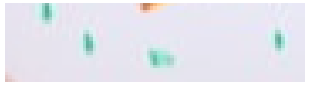
Calculation Policy

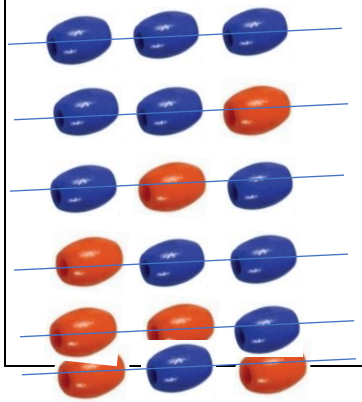
F1 – Year 6

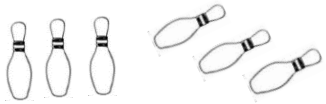
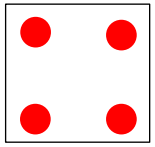
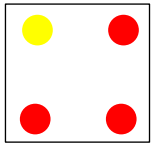
Addition, Subtraction, Multiplication and Division

Written by C Dasgupta and V Knezevic August 2024

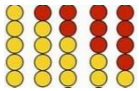
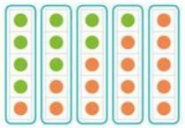
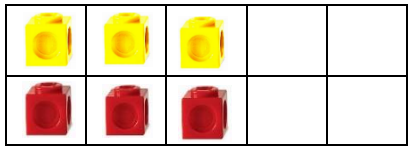
Addition

F1	Addition	
Vocabulary: subitise, more, and, add, how many? How many altogether? What do you see? What is different? What is the same?		
Concrete	**Pictorial**	**Abstract**
Perceptual subitising Instantly recognising how many are in a small set. Initially focus on items arranged in regular arrangements e.g. dice/domino patterns   	**Number talk** Plan number talk opportunities and take advantage of incidental opportunities for number talk when looking at books and images or when drawing, drawing attention to subitising and/or the concepts of adding amounts together, adding 1 more, how a group (nu-) c… split up into parts.  	**No formal written method.** **Mental** Encourage children to visualise a particular dice pattern and attempt to 'draw the dots' in the air/arrange toys or manipulatives in that way. Behind a screen, tap an instrument twice, pause then add another tap…*"How many times did I tap my instrument altogether*" repeat this time verbalising as you tap *"1…2……and 1 more…makes 3 taps"* .
Discussion of mathematical ideas throughout the day Attention to an amount/a group getting bigger when more is added to it. E.g., balls of playdough, milk in a cup, sand in a bucket.  *"First I had a small ball of playdough…then I added some more…now I have got a bigger ball of playdough, I have more."* *"We've got 3 children in our circle, 2 more are joining in…oh look our circle is bigger now, first we had 3 children…then 2 more came…now…how many children have we got altogether?"*	  *"3…4, 5… there are 5 children altogether".*	**Begin to explore with own symbols and marks (jottings)**  
One more *"4 children are in my line and here comes 1 more… that makes 5 children in my line."* *"I'm picking up my toys…1…2…3 and 1 more makes 4!"* 		**Begin to explore with own symbols and marks (jottings)** 

Picture books, songs and rhymes that add 1 more each time.		
<u>One to one correspondance</u> *"Have we got enough chairs? We need to get 1 more! 2 and 1 more makes 3"* 		
<u>Adding amounts together/combining groups</u> *"1 pinecone standing up and 1 pine cone laying down…1,2…2 pine cones altogether"* 		**<u>Match amounts to numerals</u>** 
<u>Begin to explore the composition of numbers up to 5</u> *2 pots of different coloured beads. Let's make a necklace with 3 beads…can you make another necklace with 3 beads that is different? What is different and what is the same?* 	**Children draw the beads on a line to show early composition of 5.**	

F2	Addition	
Vocabulary: subitise, number, numeral, composition, whole/part/part, number bonds, double, and, add, plus, equals, altogether, total, count on		
Concrete	**Pictorial**	**Abstract**
Composition of numbers  Children talk about the different arrangements they can see within a whole. Play games e.g., skittles and looking at how many are standing. How many have fallen over? How many are there altogether?	Show children pictures of the skittles. Can children identify the two parts?  How can they show it? Circle. 	Children record their mathematical knowledge and skills using pictorial representations, part, whole model, drawings, jottings and mathematical statements/language. Encourage children to draw signs in the air.
Exploring a number How many different ways can we make 4? What is different? What is the same?  **Also use cubes and ten frame. Number talk opportunities through books and daily routines.** 	  4 is 3 and/+1	

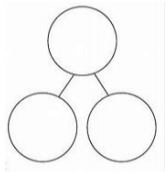
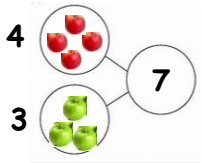
<table>
<tr>
<td></td>
<td><u>Numeral track to show one more</u>
 
</td>
<td rowspan="4"><u>Instant Recall</u>
• Number bonds to 5
• Some number bonds to 10

<u>Mental</u>
Encourage children to visualise a hidden group and calculate how many altogether for example there are 3 apples in the bowl, there are 4 apples next to the bowl, how many apples altogether? 3 plus 4 equals… how do you know? Convince me.</td>
</tr>
<tr>
<td><u>Systematic working and commutativity (counters/cubes)</u>
Ways to make numbers to 5 (can show on a 5/10 frame).
  </td>
<td><u>Ways to make numbers to 5</u>
  </td>
</tr>
<tr>
<td><u>Exploring numbers using equiptment</u>
 
<u>Numicon, rekenrek (in provision)</u>
<u>And counters, cubes, sorting bears, etc.</u></td>
<td><u>Jottings</u>
4 and 1 makes 5
  </td>
</tr>
<tr>
<td><u>5 frames and 10 frames.</u>
3 + 3
  </td>
<td><u>Jottings</u>
3 + 3
  </td>
</tr>
</table>

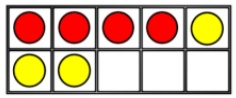
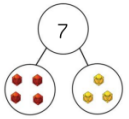
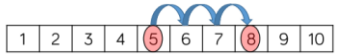
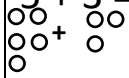
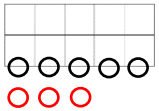
<table>
<tr>
<td><u>Conceptual subitising</u>

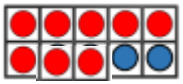
Recognising smaller groups within a larger set and adding those small groups together, such as 2 dots

  </td>
<td>Many different representations
2 + 2 = 4
  4

Lots of different pictorial representations such as dice patterns.</td>
<td rowspan="3"></td>
</tr>
<tr>
<td><u>Bar model (to be used concrete only)</u>
  </td>
<td></td>
</tr>
<tr>
<td><u>Joining two groups and counting all.</u>
 
apples   and/plus makes/equals 7
 
<u>Then moving on to using cubes and counters.</u></td>
<td>   

Tell a number story to match a picture.
The boy has 3 green apples, and the girl has 4 red apples. Altogether they have 7 apples.</td>
</tr>
</table>

YEAR 1	Addition	
Vocabulary: Addition, add, plus, forwards, put together, make, more than, total, altogether, equals, same as, greater than, most, pattern, odd, even, digit, counting on, part, whole, number bond, numeral, number, commutativity, inverse, systematic.		
Concrete	**Pictorial**	**Abstract**
Add numbers within 10 4 + 3 = 7 3 + 4 = 7   7 = 4 + 3   Dienes or cubes	**Add numbers within 10** **Numeral track (counting on):** 5 + 3 = 8  **Dienes jottings (preferred method):** 5 + 3 = 8  **Including the part whole model** **Ten frame jottings preferred method** 	Mental facts to 10 **Number facts** Recall and use addition facts to 10 fluently **the total of 6 and 3 6 plus 2 4 more than 5** **Near doubles:** Instantly recall doubles to 10 and use this to calculate near doubles. 4 + 5 = 4 + 4 + 1 OR 4 + 5 = 5 + 5 - 1 **One and two more:** Of numbers up to 10. 8 + 1 = 9 (consecutive numbers) 5 + 2 = 7 (Consecutive odd or even numbers) 4 + 2 = 6
Number bonds to 10: Rekenrek **8 + 2 = 10** 	**Number bonds to 10:** 8 + 2 = 10 	

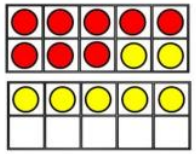
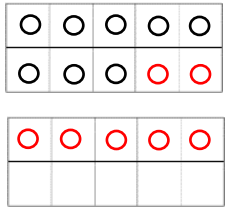
<table>
<tr>
<td>Numicon
 
10 frame
  </td>
<td></td>
<td><u>Instant recall of facts</u>
Number bonds to 10:
0 + 10 = 10
1 + 9 = 10
2 + 8 = 10
3 + 7 = 10
4 + 6 = 10
5 + 5 = 10
6 + 4 = 10
7 + 3 = 10
8 + 2 = 10
9 + 1 = 10
10 + 0 = 10</td>
</tr>
<tr>
<td><u>Add numbers within 20:</u>

12 + 3 = 15
 
dienes</td>
<td><u>Add numbers within 20 including number bonds to 20:</u>

12 + 3 = 15
 
Dienes jottings</td>
<td rowspan="3">Mental facts to 20
<u>Partitioning (bridging through 10):</u>
5 + 7
5 + 5 + 2 (partition 7 into 5 and 2) OR
7 + 3 + 2 (partition 5 into 3 and 2)

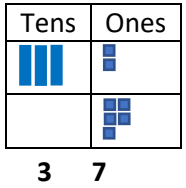
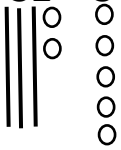
<u>Using known facts and place value</u>
15 + 4
5 + 4 = 9 so 15 + 4 = 19

<u>Number facts</u>
Know number pairs with a total of 20
16+☐ = 20 20 = 3+☐

<u>One and two more:</u>
Of numbers up to 20.
18 + 1 = 19 (consecutive numbers)
15 + 2 = 17 (Consecutive odd or even numbers)
14 + 2 = 16</td>
</tr>
<tr>
<td>Crossing ten
8 + 7 = 15
  </td>
<td>  </td>
</tr>
<tr>
<td>Counting on:
Cubes
8 + 7 = 15  </td>
<td></td>
</tr>
</table>

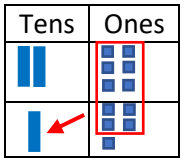
Written by C Dasgupta and V Knezevic August 2024

Number bonds to 20: **16 + 4 = 20** **4 + 16 = 20** **Rekenrek (beginning systematically moving one each time)** 		**Instant recall of facts:** **Number bonds to 20** **Redistribution:** 12 + 5 redistributes to 10 + 7. **Commutativity and Inverse** 16 + 4 = 20 20 – 16 = 4 4 + 16 = 20 20 – 4 = 16 Missing Number/Inverse **□ - 5 = 12 12 - □ = 4**

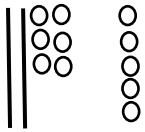
YEAR 2	Addition	
Vocabulary: Addition, add, plus, altogether, count on, equals, in total, in all, same as, whole, part, number bonds, number sentence, calculation, number, numeral, digit (one-digit, two-digit), odd, even, pattern, tens, ones, partition, commutativity, jottings, inverse. (see previous year groups)		
Concrete	**Pictorial**	**Abstract**
Children need to be secure in number bonds to 10 and 20. See Year 1 addition policy.		
Adding 2 digit numbers + multiples of 1 and 10 Dienes **Linear** (preferred method) **Column** 32 + 5 = 37   3 7 Leading onto a 2-digit number add tens (34 + 40) And two 2-digit numbers (34 + 42)	**Adding 2-digit numbers + multiples of 1 and 10** Jottings 32 + 5 = 37  Same method for adding a 2-digit number and tens and two 2-digit numbers together.	**Adding 2-digit numbers + multiples of 1 and 10** **Linear** (preferred method) **Column** 32 + 5 = 37  **These written methods only to be shown alongside pictorial**

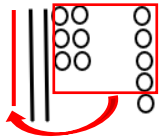
<table>
<tr>
<td><u>Crossing the tens boundry</u>
Exchanging
Dienes

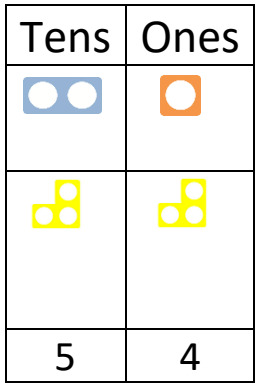
<u>Linear</u> (preferred method)
26 + 5 = 31
 

<u>Column</u>
 

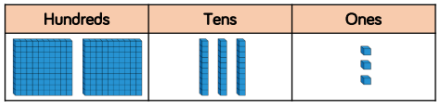
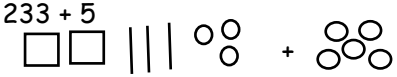
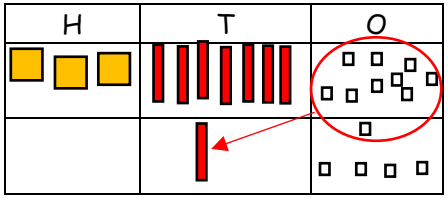
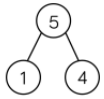
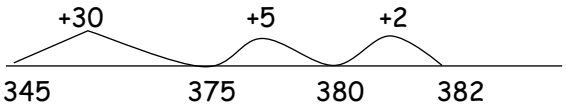
3 1
Leading onto adding two 2-digit numbers (34 + 47) crossing the tens boundry.</td>
<td><u>Crossing the tens boundry</u>
Exchanging
Jottings

<u>Count on</u>
26 + 5 = 31
 

<u>Exchange</u>
26 + 5 = 31
 
Same method for adding a 2-digit number and tens and two 2-digit numbers together.</td>
<td></td>
</tr>
<tr>
<td><u>Summer Term</u>
Column method using Numicon (to aid transition to the Junior School).

 
</td>
<td>No pictorial representation. Stop at concrete.</td>
<td></td>
</tr>
</table>

Mental Methods		
Number facts: **Known complements to the next multiple of 10** 52 + ___ = 60 **Know pairs of multiples of 10 totalling 100** 60 + ___ = 100 **Number bonds to 10:** 46 + 4 = 50 (**6 + 4 = 10**) **Counting on:** 37 + 20 **(+10 then +10)** 42 + 23 **(+20 then +3)** 47 + 15 **(+10, +3 to the next 10 then +2)** **Near doubles:** If 7 + 7 = **14** Then 7 + 8 = **14** + 1 = 15	**Redistribution:** 38 + 47 Redistribute to 40 + 45 = 95 **Partitioning:** 23 + 12 20 + 10 = **30;** 3 + 2 = **5; 30 + 5 = 35** **Adjusting:** 34 + 9 **(+10 then subtract 1)** 45 + 19 **(+20 then subtract 1)**	**Using known facts and place value:** 63 + 4 If **3 + 4 = 7** then **63 + 4 = 67** 40 + 50 If **4 + 5 = 9** then **40 + 50 = 90** **Inverse:** Understand and use the inverse to solve missing number problems/calculations: 45 + 8 = 53 8 + 45 + 53 53 – 45 = 8 53 – 8 = 45

YEAR 3	Addition	
Vocabulary: Hundreds, tens, ones, estimate, partition, recombine, difference, decrease, near multiple of 10 and 100, inverse, rounding, column subtraction, exchange. See also Y1 and Y2		
Concrete	**Pictorial**	**Abstract**
Adding 100s, 10s and 1s no exchanging: (Use diennes, place value counters or numicon).  233 + 5 233 + 40 233 + 600 Initially add 1, 10 and 100 before moving onto adding multiples of 1, 10 and 100.	**Adding 100s, 10s and 1s no exchanging:** Use diennes notation: 233 + 5  **456 + 40**	No written method – mental calculation
Adding 100s, 10s and 1s exchanging: 379 + 5 = 384  10 ones = 1 ten (for 379 + 40 then 10 tens = 1 hundred)	**Adding 100s, 10s and 1s exchanging:** **Partitioning:** 379 + 5 = 384  379 + 1 = 380 380 + 4 = 384 346 + 7 = 353  46 + 4 = 50 50 + 3 = 53 so 346 + 7 = 353 345 + 37 = 382 (Partitioning the second number and counting on)  	**Adding 100s, 10s and 1s exchanging:** Could possibly show this before showing the whole column method: **Adding 1s** 346 + 7 13 40 300 353 **Adding 10s** 346 + 70 6 110 300 416

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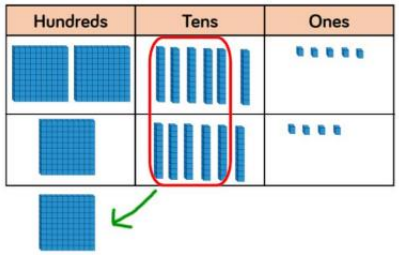
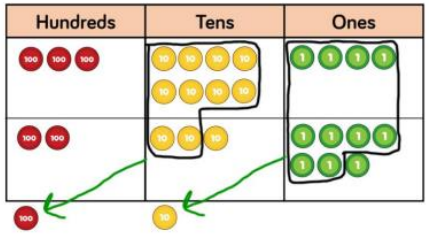
Adding 3-digit numbers:
Starting with no exchanging leading onto exchanging in the ones then the tens then the ones AND tens.

Diennes:



HTO
265
+ 164
429
1

Place Value Counters (when children are secure with the value of each digit:

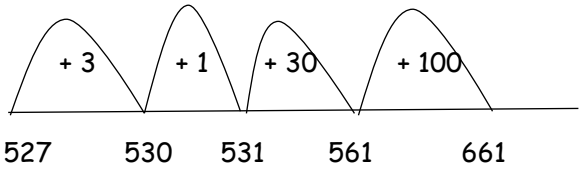


HTO
384
+ 237
621
1 1

Adding 3-digit numbers:

?	
265	164

Number line:
Alternative strategy if needed.
527 + 134 = 661



Add numbers with up to 3 digits
No exchanging:

HTO
322
+ 235
557

Exchanging:

Ones to tens	Tens to hundreds
HTO	HTO
527	362
+ 134	+ 451
661	813
1	1

Mental Methods

Counting On
137 + 50
(counting on in tens; 147, 157, 167, 177)

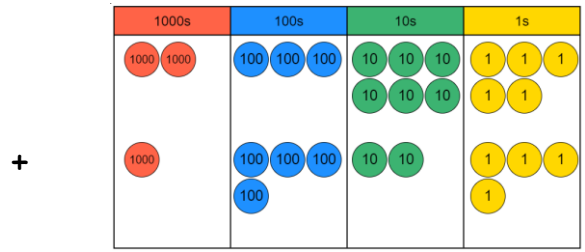
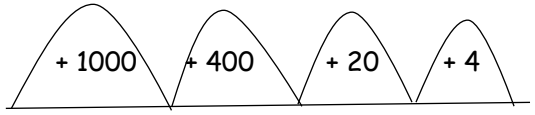
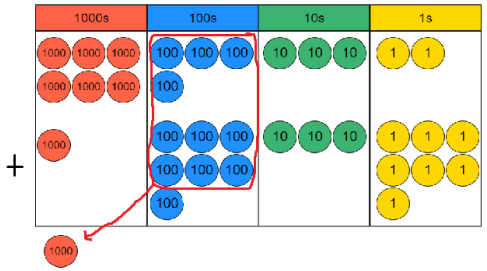
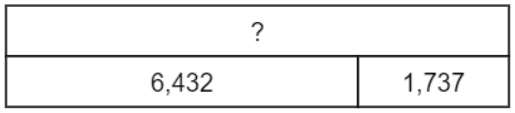
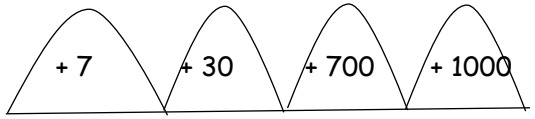
Adjusting:
234 + 29 **(add 30 and subtract 1)**
234 + 99 **(add 100 and subtract 1)**
234 + 299 **(add 300 and subtract 1)**

Using Known Facts and Place Value:
282 + 7
2+7=9 so 282+7= 289
231 + 50
30 + 50 = 80 so 231 + 50 = 281

Partitioning:
236 + 133
200 + 100 = **300**
30 + 30 = **60**
6 + 3 = **9,**
So 300 + 60 + 9 = 369

Redistribution:
136 + 47 redistribute to 133 + 50 = 183

Written by C Dasgupta and V Knezevic August 2024

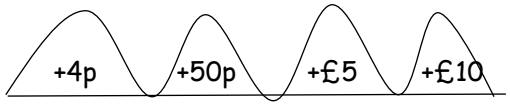
YEAR 4	Addition	
Vocabulary: thousands, hundreds, tens, ones, estimate, partition, recombine, increase, near multiple of 10 and 100, inverse, rounding, column addition, exchange, addend + addend = sum/total (See previous year groups.)		
Concrete	Pictorial	Abstract
Add whole numbers with up to 4 digits. **No exchanging:** 2365 + 1424 = 3789  	**Add whole numbers with up to 4 digits.** **No exchanging:** 2365 + 1424 = 3789  2365 3365 3765 3785 3789 Building to mental method.	Written **Add whole numbers with up to 4 digits.** **No exchanging:** Th H T O 2 3 6 5 + 1 4 2 4 3 7 8 9
Exchanging: 6,432 + 1,737 = 8169  Start without exchanging leading onto exchanging at different points (ones to tens; tens to hundreds etc).	**Exchanging:** 6432 + 1737 = 8169   6432 6439 6469 7169 8169 (Could split + 700 into + 600 then + 100 to cross boundaries if needed.)	**Exchanging:** Th H T O 6 432 + 1 737 8 169 1

Add decimals up to 2 decimal places (as money or measures):
£15.54 + £26.25 = £41.79

T	O	th	hth
			
			

Use counters or money depending on the context.
Start with no exchanging leading to exchanging.

Add decimals up to 2 decimal places (as money or measures):
£15.54 + £26.25 = £41.79



£26.25 £26.29 £26.79 £31.79 £41.79

Add decimals up to 2 decimal places (as money or measures):

Compact
TO.th
£26.25
+ £15.54
£41.79
1

Mental Methods:

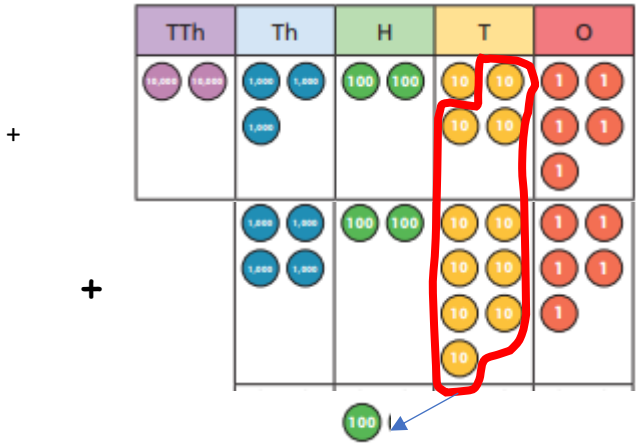
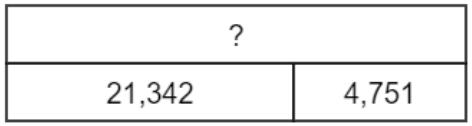
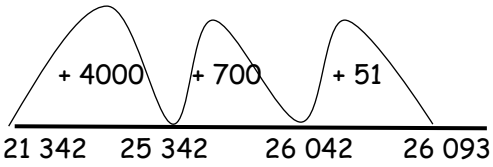
Counting on:
2534 + **2150**
2534 + **2000 + 100 + 50 = 4684**

Using known facts and place value:
5060 + 47
60 + 47= 107 so 5060 + 47 = 5107
0.6 + 0.2
If **6 + 2 = 8** then **0.6 + 0.2 = 0.8**

Redistribution:
2504 + 3234 redistribute to 2500 + 3238.

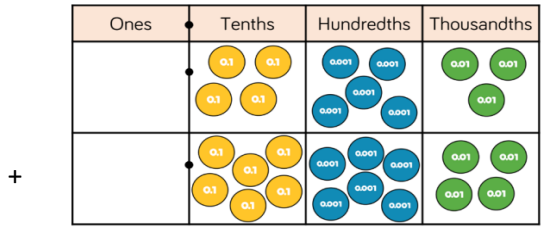
Adjusting:
Demo on a number line first.
2345 + 499 **(add 500 and subtract 1)**
2345 + 2999 **(add 3000 and subtract 1)**

Partitioning:
2314 + 1242
2000 + 1000 = **3000**
300 + 200 = **500**
10 + 40 = **50**
4 + 2 = **6**
3000 + 500 + 50 + 6 = 3556

YEAR 5	**Addition**	
Vocabulary: sum, total, parts and whole, plus, add, altogether, more than; addend + addend = sum/total (see previous year groups)		
Concrete	Pictorial	Abstract
Add whole numbers with more than 4 digits. (up to answers with 6 digits.) 21,342 + 4,751 =  	**Add whole numbers with more than 4 digits.** 21,342 + 4,751 = 26,093  Number line: Alternative method if needed. 21 342 + 4 751 = 26 093  	Written Add whole numbers with more than 4 digits. (No exchanging should be a mental method) Exchanging (building up from non-exchanging then exchanging at different points.) 21,342 + 4,751 = 26,093 TTh Th H T O 2 1, 3 4 2 + 4, 7 5 1 2 6, 0 9 3 1

Adding decimals (up to 3 decimals places)
Start with no exchanging then build up by exchanging at different points.

0.453 + 0.664 = 1.117

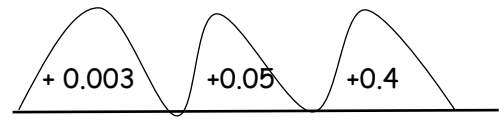


1 . 1 1 7

Adding decimals (up to 3 decimal places)

0.453 + 0.664 = 1.117

0.453	0.664



0.664 0.667 0.717 1.117

Adding decimals

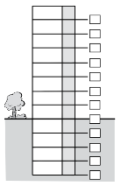
Exchanging
(building up from non exchanging then exchanging at diferent points)

O . t h th
0 . 4 5 3
\+ 0 . 6 6 4
1 . 1 1 7

1 1

Adding negative numbers

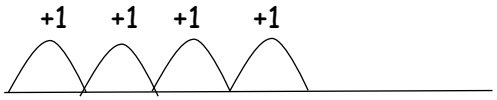
Using real life objects:



Adding negative numbers

Using a number line (the number line could be represented vertically too):

-3 + 4 = 1



-3 -2 -1 0 1 2 3

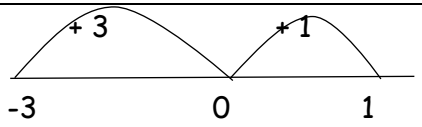
Building up to:

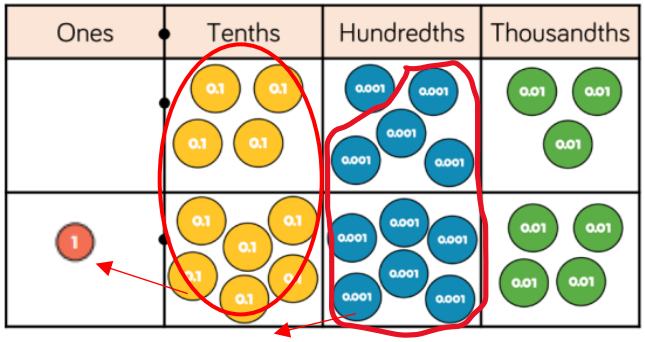
-3 + 4 = 1

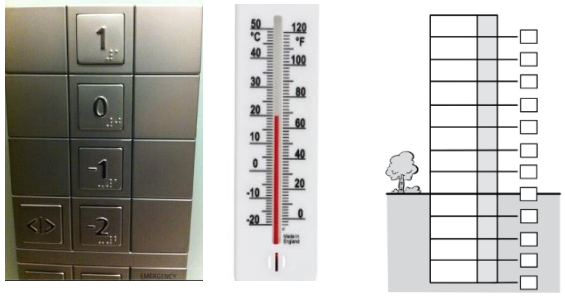
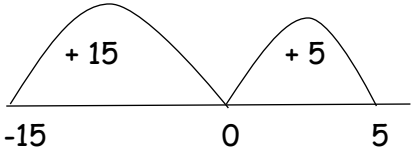
Adding negative numbers

Develops into a mental method – no written method.

Written by C Dasgupta and V Knezevic August 2024

		
Mental Methods:		
Counting on: 4.3 + 1.5 (partition 1.5 then + 1 and + 0.5) 19.7 + 2.6 (+ 2, +0.3 to the next whole number then +0.3) **Redistribution:** 0.66 + 0.23 redistribute to 0.69 + 0.20	**Adjusting:** 2,456 + **399 (add 400 and subtract 1)** 8.3 + 1.9 **(add 2 and subtract 0.1)** 14.6 + 3.9 **(add 4 and subtract 0.1)** **Using known facts and place value:** 7.5 + 2.6 **7.5 + 2.5 = 10 so 7.5 + 2.6 = 10.1** 0.06 + 0.08 If **6 + 2 + 8** then **0.06 + 0.02 = 0.08** Derive and use addition facts to 1 (with decimals up to 2 decimal places.) Recall and use addition facts for 1 and 10 (with decimal numbers up to 1 place.) Recall pairs of 3 digit numbers with a total of 1000.	**Partitioning:** **Adding a power of 10** (ensure use of PV headings) 23 453 + 10 000 = 33 453 45 321 + 1 000 = 46 321 **No exchanging** 42 345 + 21 423 = 63 768 **Exchanging** 3.6 + 1.7 3 + 1 = **4** 0.6 + 0.7 = **1.3** **4 + 1.3 = 5.3**

YEAR 6	Addition	
Vocabulary: sum, total, parts and whole, plus, add, altogether, more than; addend + addend = sum/total (see previous year group)		
Concrete	Pictorial	Abstract
Add larger whole numbers. 6,537,206 + 1,374,023 = 7,911,229 No place value counters for larger numbers. Revisit previous years' addition calculation policies.	**Add larger whole numbers** Number lines from previous year groups are used if needed.	**Add larger whole numbers (exchanging at different points)** M HTh TTh Th H T O 6 5 3 7 2 0 6 + 1 3 7 4 0 2 3 7, 9 1 1, 2 2 9 1 1
Adding decimals up to 3 decimal places. (including decimals with different numbers of decimal places) 0.453 + 0.664 = 1.117  	**Adding decimals up to 3 decimal places.** (including decimals with different numbers of decimal places) See previous addition policies if needed for jottings using a number line.	**Adding decimals up to 3 decimal places** (including decimals with different numbers of decimal places) O . t h th 0 . 4 5 3 + 0 . 6 6 4 1 . 1 1 7 1 1

Adding negative numbers In real life contexts 	**Adding negative numbers** -15 + 20 = 5  	**Adding negative numbers** Develops into a mental method – no written method.

Mental

<u>Counting on:</u>
6.46 + 2.03
(partition 2.03 then +2 and +0.03)

<u>Adjusting:</u>
34 256 + 14 999 **(add 15 000 and subtract 1)**
6.73 + 0.99 **(add 1 and subtract 0.01)**

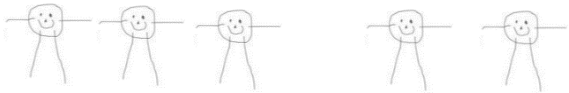
<u>Using known facts and place value:</u>
0.64 + 0.36
64 + 36 = 100 so 0.64 + 0.36 = 1

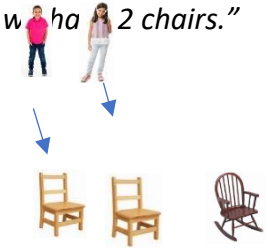
<u>Partitioning:</u>
Adding a power/multiple of 10
163 453 + 20,000
275 321 + 1,000
(children recognise which column will change)

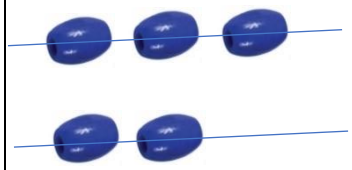
No exchanging
345 252 + 223 516
3.421 + 2.357

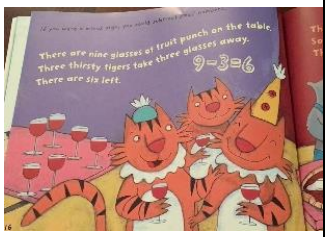
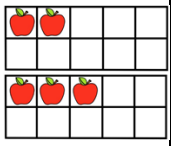
Exchanging
3.4 + 2.77
3 + 2 = **5**
0.4 + 0.7 = **1.1**
5 + 1.1 + 0.07 = 6.17

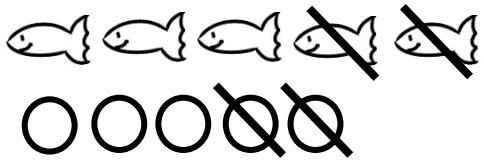
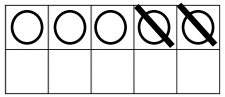
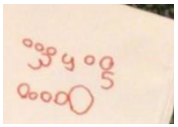
Subtraction

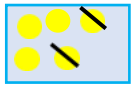
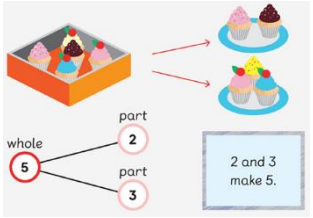
F1	Subtraction	
Vocabulary: subitise, less, fewer, subtract, smaller, number, numeral, draw it, how many are left? What do you see? What is different? What is missing?		
Concrete	**Pictorial**	**Abstract**
Perceptual subitising Instantly recognising how many are in a small set. Initially focus on items arranged in regular arrangements e.g. dice/domino patterns 	**Number talk** Plan number talk opportunities and take advantage of incidental opportunities for number talk when looking at books and images or when drawing, drawing attention to subitising and/or the concepts of making an amount smaller, 1 less, how a group/number/part can be removed. 	**No formal written method.** **Mental** Encourage children to visualise a particular dice pattern and attempt to 'draw the dots' in the air/arrange toys or manipulatives in that way. Behind a screen, tap an instrument twice, pause then do one less tap…*"How many times did I tap my instrument the second time? Was it more or less?"*
Discussion of mathematical ideas throughout the day Attention to an amount/a group getting smaller when a part is removed. E.g., balls of playdough, milk in a cup, sand in a bucket.  *"First I had a big ball of playdough…then I removed some…now I have got a smaller ball of playdough, I have less."* *"We've got 5 children in our circle, 2 children leave…oh look our circle is smaller now, first we had 5*	 *"1, 2, 3, there are 3 children left".*	**Begin to explore with own symbols and marks (jottings)**  

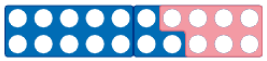
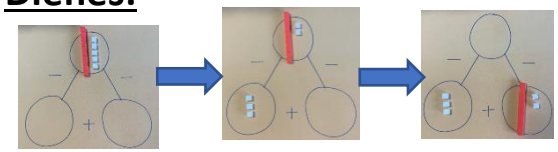
children…then 2 children went away…now…how many children have we got left?"		
<u>One less</u> *"4 children are in my line. 1 runs out of the line… that makes 3 children in my line."* *"I'm picking up my toy cars…1…2…3…4. 1 car drives away. Now I have 3 toy cars.!"*  Picture books, songs and rhymes for 1 less.		**<u>Begin to explore with own symbols and marks (jottings)</u>** 
<u>One to one correspondance</u> *"Have we got enough chairs? We have too many. We need to put one back. Now w ha 2 chairs."* 		
<u>Subtracting a group/part.</u> *"1 pinecone standing up and 1 pinecone rolls away. I have 1 pinecone left.* 		**<u>Match amounts to numeral</u>**  

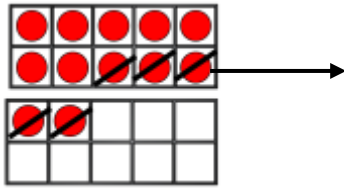
<u>Begin to compare amounts</u> *Beads* *What do you see? Which necklace has less number of beads? Can you make a necklace which has less beads than my necklace?* 	**Children draw the beads on a line.**	

F2	Subtraction	
Vocabulary: number, numeral, digit (one-digit, two-digit), amount, more than, fewer than, less than, pattern, count back, subtract, minus, equals, part, whole.		
Concrete	**Pictorial**	**Abstract**
Daily routines and mathematical discussions "We usually have 4 children in our reading group, but Tom is away, how many children do we have now" Counting backwards throughout the day – can you put your lids on your pens before I finish counting back from 5? 5, 4, 3, 2, 1, 0…" "Yesterday we had 4 hats in lost property, today we have 2, that is less/fewer than yesterday."	**Number talk** Plan number talk opportunities and take advantage of incidental opportunities for number talk when looking at books and images.  	Children record their mathematical knowledge and skills using pictorial representations, part, whole model, drawings, jottings and mathematical statements/language. Encourage children to draw signs in the air.
Taking amounts away/discussing the difference "Here is my 10-frame and this is yours, who has less?" 	"There were 5 fish and 2 swam away, how many were left?" 	

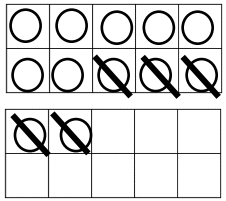
"I have 5 bears in total, I am taking 2 away, how many are left?" Can also use cubes as concrete objects.	**Jottings**  **Ten frame jottings** 	
<u>One less</u> "I had 4 children on my carpet but 1 has gone outside, how many children are left" "I have 3 special pens, but one has run out, so now I have one less than 3…. how many do I have left? 	When singing songs, drawing attention to the subtraction happening. 5 green bottles hanging on the wall, "one green bottle fell, how many green bottles are hanging on the wall now?"  **<u>Other song ideas:</u>** <u>5/10 little monkeys, 5/10 little ducks.</u> **<u>Numeral track to show one less.</u>**  	**<u>Begin to explore with own symbols and marks (jottings)</u>** Children to be given a mathematical concept and asked to make marks to represent this (mathematical jottings) *Yusuf had 5 apples; he gave 2 to Alex.*  

<u>Develop a deep understanding of number to 10, including the composition of each number with the use of games</u>  compose and decompose numbers to 10 using skittles. “I had 10 skittles, 2 got knocked down, how many are left standing?” Other ideas including biscuits, fruit.	Use pictorial representations to show that 2 parts make a whole and refer to this method when decomposing numbers. **5-2=3** **5-3=2**   	**<u>Recording scores using marks and beginning to include the use of numerals (Provision and small groups).</u>**  Encourage children to keep scores of their games by using marks and symbols and eventually including numerals in this.

YEAR 1	Subtraction	
Vocabulary: Subtraction; subtract; minus; difference between; more than; greater than, fewer than; minus; less than; most; least, part, whole, number, numeral, equals, inverse.		
Concrete	**Pictorial**	**Abstract**
Subtract numbers (reduction) **Numicon:**  **Rekenrek:**  **Dienes:**  **12 – 1 = 11**  **Move one away to subtract 1.** **Ten frames** 12 – 5 = 7	**Subtract numbers (reduction)** As above plus: **Dienes jottings:** 8 – 3 = 5  15 – 3 = 12  12 – 5 = 7	Children record their mathematical knowledge and skills using pictorial representations, arrays, jottings and mathematical statements. **Mental facts to 10 and 20.** **Using known facts and place value** If 6 – 4 = 2 Then **1**6 – 4 = **1**2 **Counting back:** Counting back in ones 16 – 5 = 11 16, 15, 14, 13, 12, **11** **Counting on:** (see number line above) 15 – 11 = 4 Hold 11 in your head and count on until 15. The difference is 4. **Partitioning:** (Bridging through 10) 11 **– 4** 11 **– 1** = 10 10 **– 3** = 7



Move objects away to subtract the



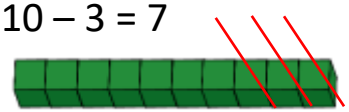
Missing Number/Inverse:

8 + □ = 19 □ + 12 = 20

Subtract numbers

Counting back:

10 – 3 = 7



Using cubes, objects and tens frames.

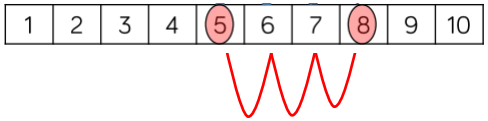
Rekenrek:

Numicon:

Subtract numbers

Counting back:

8 – 3 = 5



-1 -1 -1

Counting back:

Counting back in ones:

8 – 3 = 5

8, 7, 6, **5**

One and two less:

Of numbers up to 10.

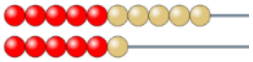
8 - 1 = 7 (consecutive numbers)

6 - 2 = 4 (Consecutive odd or even numbers)

Counting on: (finding the difference)

Cubes: 10 – 6 =

10

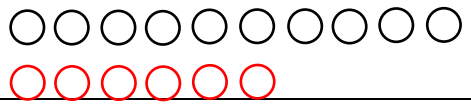


6

Rekenrek:

Counting on: (finding the difference)

10 – 6 = 4

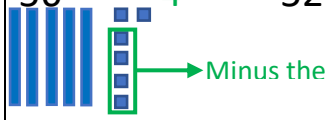
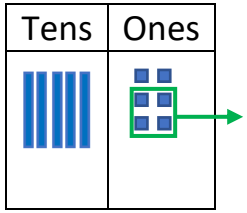
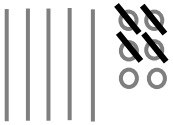


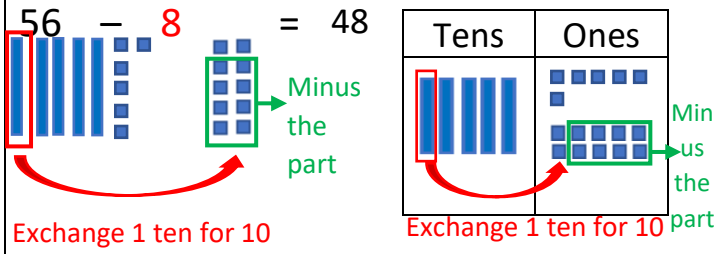
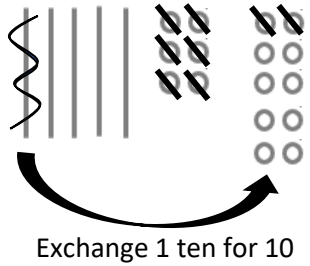
Counting on:

9 – 7 =2

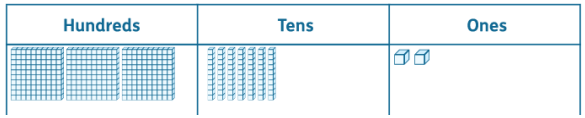
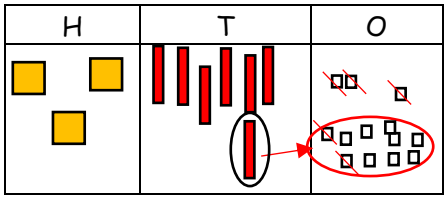
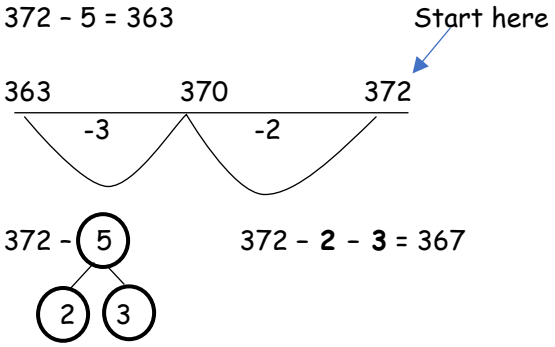
Hold 7 in your head and count on until 9. The difference is 2.

		<u>Number facts/fact families (to 10 and 20)</u> 10 – 2 = 8 20 – 2 = 18 10 – 8 = 2 20 – 18 = 2 2 + 8 = 10 2 + 18 = 20 8 + 2 = 10 18 + 2 = 20

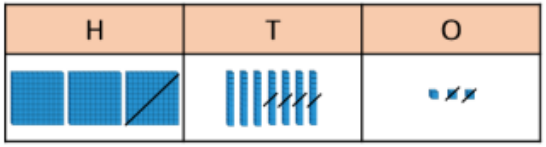
YEAR 2	Subtraction	
Vocabulary: Subtraction, subtract, minus, whole, part, count back, left, missing part, equals, same as, number family, number sentence, calculation, number, numeral, digit (one-digit, two-digit), odd, even, pattern, tens, ones, jottings, inverse (see previous year groups)		
Concrete	**Pictorial**	**Abstract**
Children need to be secure in number bonds to 10 and 20. See Year 1 subtraction policy.		
Subtracting 2-digit numbers + multiples of 1 and 10 Dienes **Linear** (preferred method) **Column** 56 – 4 = 52   Leading onto a 2-digit number subtracting tens (56 – 30) and a 2-digit number subtracting another 2-digit number not crossing the tens boundary (56 – 32).	**Subtracting 2-digit numbers + multiples of 1 and 10** Jottings 56 – 4 = 52  Leading onto a 2-digit number subtracting tens (56 – 30) and a 2-digit number subtracting another 2-digit number not crossing the tens boundary (56 – 32).	**Subtracting 2-digit numbers + multiples of 1 and 10** Written **Linear** (preferred method) **Column** **56 – 4 = 52** Tens | Ones 5 | 6 - | 4 5 | 2 These written methods are only shown alongside the pictorial representation.

Crossing the tens boundary Exchanging (dienes) **Linear** (preferred method) **Column** 56 – 8 = 48  Leading onto subtracting a 2-digit number from another 2-digit number crossing the tens boundary (56 – 38).	**Crossing the tens boundary** Exchanging (Jottings) 56 - 8 = 48  Leading onto subtracting a 2-digit number from another 2-digit number crossing the tens boundary (56 – 38).	
Summer Term **Column method using Numicon (no exchanging)** (to aid transition to the Junior School). **72 – 20 =**  	**No pictorial representation. Stop at concrete.**	

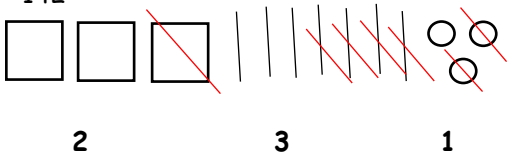
Mental Methods	
<u>Number families:</u> Using knowledge of inverse: If 23 + 31 = 54 Then 54 – 23 = 31 **<u>Counting on/up:</u>** (for small differences between numbers) 34 – 28 = 6 28 **+ 2** = 30 30 **+ 4** = 34 **2 + 4 = 6** **<u>Counting back:</u>** 56 – 17 = 39 56 **– 10** = 46 46 **– 6** = 40 40 **– 1** = 39 **<u>Equivalent differences:</u>** 56 – 39 is the same as 57 – 40 = 17	**<u>Partitioning:</u>** 45 - 23 40 - 20 = **20;** 5 - 3 = **2; 20 + 2 = 22** **<u>Adjusting:</u>** 36 - 9 **+1 to both sides to give:** **37 – 10 = 27** 45 - 19 **+1 to both sides to give:** **46 – 20 = 26** **<u>Using known facts and place value:</u>** 68 - 5 If **8 - 5 = 3** then **68 - 5 = 63** 70 - 30 If **7 – 3 = 4** then **70 – 30 = 40** **<u>Inverse/missing number:</u>** 41 + ___ = 56 ___ + 13 = 47

YEAR 3	Subtraction	
Vocabulary: Hundreds, tens, ones, estimate, partition, recombine, difference, decrease, near multiple of 10 and 100, inverse, rounding, column subtraction, exchange (see previous years)		
Concrete	**Pictorial**	**Abstract**
Subtracting 100s, 10s and 1s no exchanging: Using diennes moving to numicon when children are secure in the value of each digit. E.g. 40 = 4 tens.  372 – 1 372 – 40 372 – 200	**Subtracting 100s, 10s and 1s no exchanging:** Use diennes notation (if needed – bridging gap for OIS): 372 - 1  Then 372 – 40 372 – 200	No written method – mental calculation.
Subtracting 100s, 10s and 1s exchanging: 373 – 5 = 368  1 ten = 10 ones (For 372 – 80 then exchange 1 hundred for 10 tens).	**Subtracting 100s, 10s and 1s exchanging:** **<u>Counting back:</u>** 372 – 5 = 363  372 – **2** – **3** = 367	No written method – mental calculation.

Subtracting 3-digit numbers:
No exchanging:
373 – 142 = 231



Subtracting 3-digit numbers:
Diennes jottings (bridging gap from OIS):
No exchanging:
373 – 142



Written

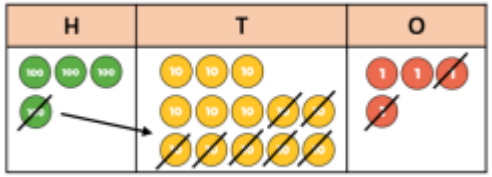
Subtracting 3-digit numbers:
No exchanging:

H	T	O
300	70	3
- 100	40	2
200	30	1

→

HTO
373
- 142
231

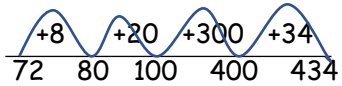
Exchanging:
434 – 72



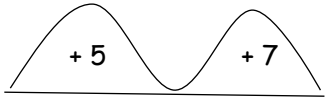
Exchange at different points e.g:
541 – 227; 627 – 385
Extending to exchanging at several different points e.g:
714 - 346

Exchanging:

Find the difference (if needed):



Counting on:
207 – 195 for numbers with small differences.



5 + 7 = 12

This should build to mental method in later years.

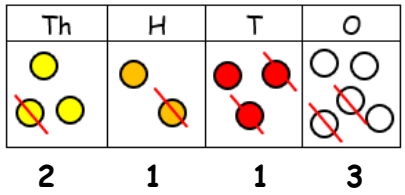
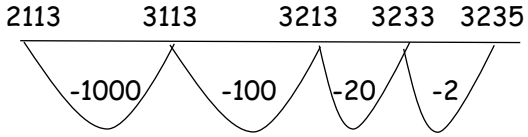
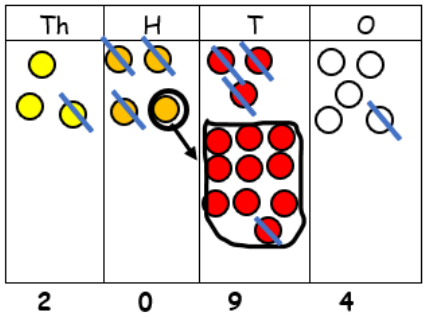
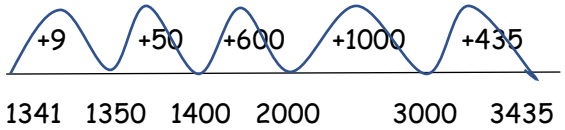
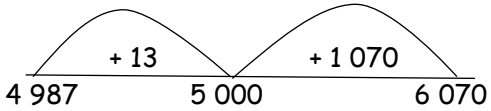
Exchanging:

Tens to ones			Hundreds to tens		
	70		300		
300	80	12	400	130	4
- 100	50	3	-	70	2
200	20	9	300	60	2

Expanded method – end of year expectation for most.

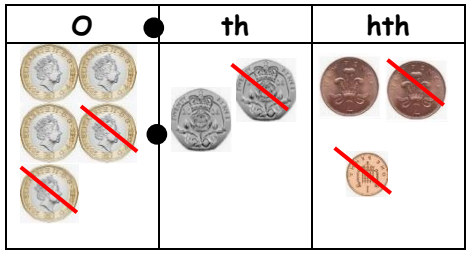
Compact method for exchanging ONLY taught if understanding and reasoning is shown in great depth of expanded method.

Mental	
Counting back: 164 – 40 = 124 **(counting back in tens: 154, 144, 134, 124)** 356 – 23 **(356 – 20 then -3)** 375 – 47 **(375 – 40, – 5 then – 2)** **Counting on (finding the difference)** **For numbers close together** 102 – 97 = 5 97 + **3** = 100, 100 + **2** = 102 Then **3 + 2 = 5** 325 – 280 = 45 280 + **20** = 300, 300 + **25** = 325 Then **20 + 25 = 45**	**Using Known Facts and Place Value:** 268 – 5 **8 – 5 = 3 so 268 – 5 = 263** 600 – 300 **6 – 3 = 3; 60 – 30 so 600 – 300 = 300** **Partitioning:** 567 – 235 **567 (– 200 – 30 – 5)** **Adjusting:** 324 – 99 **(add 1 to both numbers)** 325 – 100 = 225 456 – 298 **(add 2 to both numbers)** 458 – 300 = 158

YEAR 4	Subtraction	
Vocabulary: difference, minus, subtract, take way, less than; subtrahend – minuend = difference (see previous year group)		
Concrete	Pictorial	Abstract
Subtract whole numbers with up to 4d. **No exchanging:** 3 235 – 1 122 = 2 113  See year 3 policy for subtracting multiples of 1000, 100, 10 and 1s.	**Subtract whole numbers with up to 4d.** **No exchanging:** **Counting back:**  **Counting on:** Where the numbers in the calculation allow for easy adding of the resulting jumps.	Written **No exchanging:** Th H T O 3 2 3 5 - 1 1 2 2 2 1 1 3 (This will be a mental calculation for most children.)
Exchanging: 3 435 – 1 341 = 2 094  Exchange at different and several points e.g: **4 167 – 1342; 5462 – 2158; 5236 - 2572**	**Exchanging:** **Finding the difference (if needed):** 3 435 – 1 341 = 2 094  **Counting on (for smaller differences):** 6 070 – 4 987 = 1 083  	**Exchanging:** 3 435 – 1 341 = 2 094 **Expanded** Th H T O 300 3000 400 130 5 -1000 300 40 1 2000 0 90 4 **Compact** Th H T O 3 1 3 435 -1 341 2 094 **Compact method = end of year expectation**

Subtracting decimals up to 2 decimal places (as money or measures):

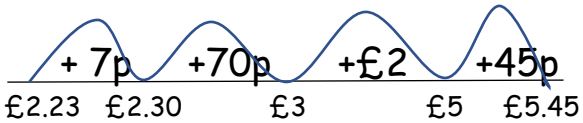
£5.45 - £2.23 = £3.22



Use numicon or money depending on the context.
Start with no exchanging leading to exchanging.

Subtracting decimals up to 2 decimal places (as money or measures):

Finding the difference:



Counting on:

Where the numbers in the calculation allow for easy adding of the resulting jumps.

Subtracting decimals up to 2 decimal places (as money or measures):

O.th

£ 5.45
-£ 2.23
£ 3.22

Mental Methods

Counting on/up (finding the difference)

3267 – 2980 = 287

2980 + **20** = 3000, 3000 + **267**

Then **20 + 267 = 287**

Counting back:

4548 – 234

(partition 234 then -200, -30, -4)

Using known facts and place value:

9000 – 3000

9 – 3 = 6; 90 – 30 = 60; 900 – 300 = 600 so 9000 – 3000 = 6000

Partitioning:

No exchanging – 4,345 – 1,223

Subtracting a power of 10:

3,453 – 1,000

5,321 – 100

(Children recognise which column will change)

Adjusting:

2,456 – 29 (**+ 1 to both numbers)** 2,457 – 30 = 2 427

2,456 - 399 (**+ 1 to both numbers)** 2,457 – 400 = 2057

2,456 – 1999 (**+ 1 to both numbers)** 2,.456 – 2000 = 456

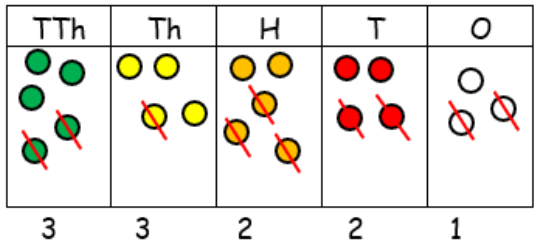
YEAR 5 — Subtraction

Vocabulary: difference, minus, subtract, take way, less than; subtrahend – minuend = difference

Concrete

Subtract whole numbers with more than 4 digits (up to 6 digit numbers)

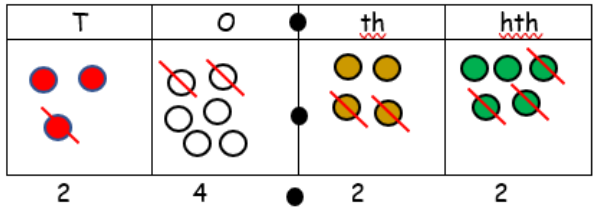
54 543 – 21 322 = 33 221



Exchanging at different and several points.
No place value digits for 6-digit numbers available.

Subtracting decimals (up to 2 decimal places)

36.45 – 12.23 = 24.22



Start with no exchanging then build up to exchanging at different points using:
1 ten = 10 ones; 1 one = 10 tenths; 1 tenth = 10 hundredths.

Pictorial

Subtract whole numbers with more than 4 digits.

Finding the difference using a number line

Step back if needed (see year 4)

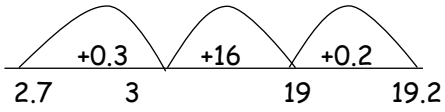
Counting on using a number line

Where the numbers in the calculation allow for easy adding of the resulting jumps.

Subtracting decimals (up to 2 decimal places)

Counting on (if needed):

19.2 – 2.7 = 16.5



Abstract

Written

Subtract whole numbers with more than 4 digits.

No exchanging

TTh	Th	H	T	O
5	4	5	4	3
- 2	1	3	2	2
3	3	2	2	1

Exchanging

TTh	Th	H	T	O
	5	1		
3	~~6~~	2	5	1
- 1	5	4	2	0
2	0	8	3	1

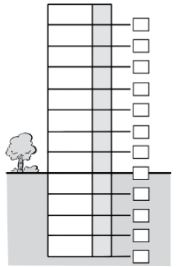
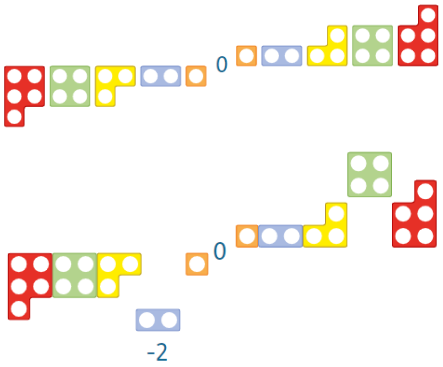
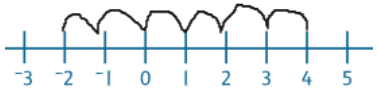
Subtracting decimals (up to 2 decimal places)

No exchanging

T	O.	t	h
3	6	.	4 5
- 1	2	.	2 3
2	4	.	2 2

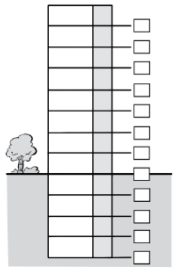
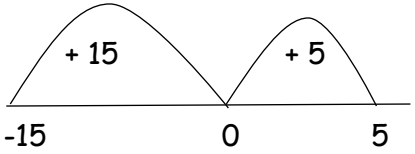
Exchanging

T	O.	t
	8	1
1	~~9~~	. 2
-	2	. 7
1	6	. 5

Subtracting negative numbers Using real life objects:    4 – 6 = Number line used and children push up starting tile and count backwards in ones. They then progress to counting back first to 0 and then the remaining 2. 	**Subtracting negative numbers** 4 – 6 = -2  Number line counting backwards in single increments from 4 to -2.  Number line counting backwards: first to 0 and then the remaining "jumps" back to -2. Could be shown vertically too.	Develops in to a mental method no written method.

Mental Methods:	
Counting on: 7.2 – 6.8 6.8 + **0.2** = 7 7 + **0.2** = 7.2 then **0.2 + 0.2 = 0.4** **Counting back:** 7.87 – 2.03 (partition 2.03 then 7.87 – 2 = 5.87 5.87 – 0.03 = 5.84. **Adjusting:** 23 345 – 1 999 **(+ 1 to both numbers)** 23 346 – 2000 = 21 346 8.3 - 1.9 **(+ 0.1 to both numbers)** 8.4 – 2 = 6.4 14.56 - 0.19 **(+ 0.01 to both numbers)** 14.57 – 2 = 12.57	**Using known facts and place value:** If 16 – 8 = **8** then: 1.6 – 0.8 = **0.8** 0.16 – 0.08 = **0.08** **Partitioning:** **No exchanging** 34 567 – 12 354 **Subtracting a power of 10** 23 453 – 10 000 = 13 453 45 321 – 1 000 = 44 321 Children recognise which column will change.

YEAR 6	Subtraction	
Vocabulary: difference, minus, subtract, take away, less than; subtrahend – minuend = difference (see previous year groups)		
Concrete	Pictorial	Abstract
Subtract larger whole numbers (exchanging at different points) 6,537,206 – 1,374,023 = No place value counters for larger numbers. Revisit previous years' addition calculation policies.	**Subtract larger whole numbers** (exchanging at different points) Number lines from previous year groups are used if needed.	**Subtract larger whole numbers** (exchanging at different points) M HTh TTh Th H T O 4 1 1 1 6 5 3 7 2 0 6 - 1 3 7 4 0 2 3 5 1 6 3 1 8 3
Subtracting decimals up to 3 decimal places. (exchanging at different points - including decimals with different numbers of decimal places)	**Subtracting decimals up to 3 decimal places.** (exchanging at different points - including decimals with different numbers of decimal places) See previous addition policies if needed for jottings using a number line.	**Subtracting decimals with up to 3 decimal places** (exchanging at different points - including decimals with different numbers of decimal places) O . t h th 3 14 1 3 . 4 5 3 - 1 . 3 6 4 2 . 0 8 9

Subtracting negative numbers In real life contexts    (See Y5 for Numicon support)	**Subtracting negative numbers** -15 + 20 = 5  (could go up in 1s first)	**Subtracting negative numbers** Develops into a mental method – no written method.

Mental Methods

<u>Counting on:</u>
6.14 – 5.76
5.76 + **0.24** = 6
6 + **0.14** = 6.14
0.24 + 0.14 = 0.38

<u>Counting back:</u>
7.87 – 2.03
Partition the second number and counting back.
7.87 – 2 = 5.87
5.87 – 0.3 = 5.84

<u>Adjusting:</u>
34 256 - 14 999 (**+ 1 to both numbers)**
6.73 - 0.99 (**+ 1 to both numbers)**

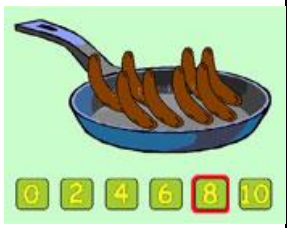
<u>Using known facts and place value:</u>
1.63 -0.8
16 – 8 = 8 so 1.63 – 0.83 = 0.83

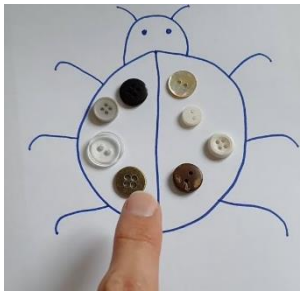
<u>Partitioning:</u>
No exchanging
456 765 – 235 243 = 221522

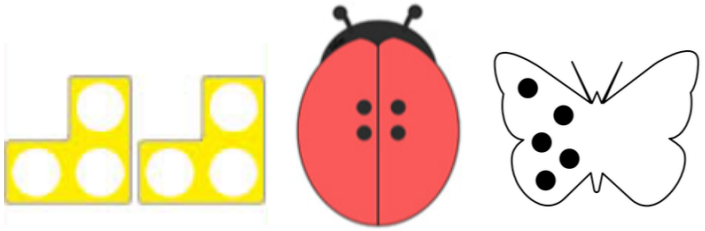
Subtracting a power/multiple of 10
163 453 - 20,000
275 321 - 1,000
(children recognise which column will change)

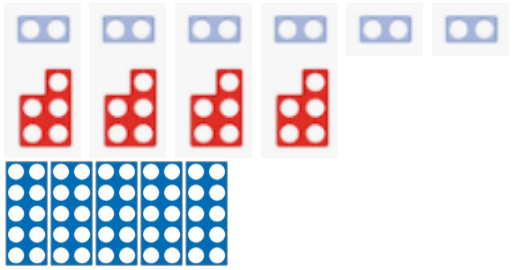
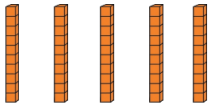
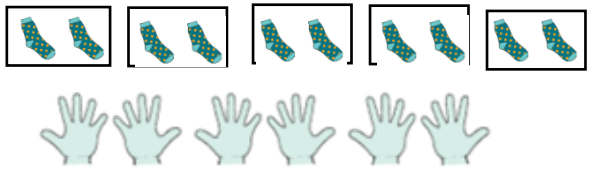
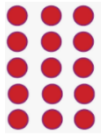
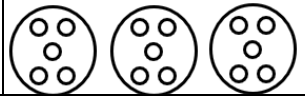
***Not always mental- but subtractions involving missing numbers must be included for each approach**

Multiplication

F2	Multiplication	
Vocabulary: ones, groups, lots of, doubling, repeated, groups of, pairs, equal groups, unequal groups.		
Concrete	**Pictorial**	**Abstract**
Daily routines and mathematical discussions Paired talk, counting in pairs when lining up. 	**Number talk** Plan number talk opportunities and take advantage of incidental opportunities for number talk when looking at books and images. 	Children record their mathematical knowledge and skills using pictorial representations, drawings, jottings and any mathematical statements or language.
Thinking about pairs of items and counting in multiples.  Counting pairs of socks.	**Stories** Mia and Jake are going on a bike ride, each bike has 2 wheels, how many wheels are there in total? 	**Begin to explore with own symbols and marks (jottings)** Children to be given a mathematical concept and asked to make marks to represent this (mathematical jottings)
Counting in groups (pairs) of 2 	**Songs and Rhymes** When singing songs, drawing attention to the multiplication happening. 10 fat sausages introduce counting in 2s. 	**Begin to explore with own symbols and marks (jottings) as above.**

<table>
<tr>
<td><u>Doubling</u>
 
Doubling using items

Also using the ten frame.</td>
<td>  </td>
<td>  </td>
</tr>
</table>

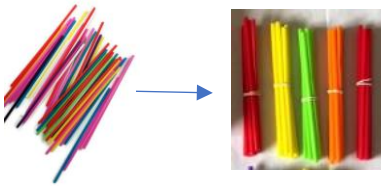
YEAR 1	Multiplication	
Vocabulary: ones, groups, lots of, doubling, repeated addition, array, row, column, equal, groups of, times, pattern, multiply, number, numeral.		
Concrete	**Pictorial**	**Abstract**
Using concrete objects to reinforce counting and equal groups of. **Counting in 2s, 5s and 10s:** Introduce with real life objects e.g., pairs of socks, hands, bunches of flowers, crayons to give context. **Numicon**  **Cubes/dienes** 	**Counting in 2s, 5s and 10s: Pictorial images**  **Jottings**  **Arrays:**   **Repeated addition/groups of** 5 + 5 + 5 = 15 3 groups of 5 is 15 	Children record their mathematical knowledge and skills using pictorial representations, arrays, jottings and mathematical statements.

<table>
<tr>
<td>

Arrays

Grouping equally:

Organising objects into equal groups to support counting in 2s, 5s and 10s.



</td>
<td>

Grouping equally:

Making equal groups using jottings.

5 groups of 2

2 + 2 + 2 + 2 + 2

5 x 2 = 10 (towards the end of the unit)

</td>
<td>

Mental methods

Counting:

Rote count in 1s, 2s, 5s or 10s up to 100.

</td>
</tr>
<tr>
<td>

<u>Also use cubes, dienes, numicon.</u>

Doubling:

Numicon

Cubes/dienes:

Ten frame: 

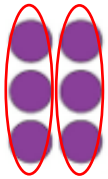
</td>
<td>

Doubling:

Arrays:

Double 3

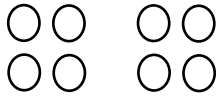
3+3



Jottings:

Double 4

4 + 4



</td>
<td>

Doubling:

Instantly recall doubles to 10

1 + 1 6 + 6

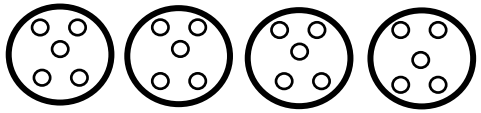
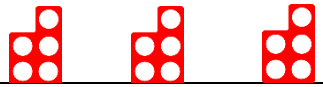
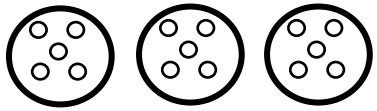
2 + 2 7 + 7

3 + 3 8 + 8

4 + 4 9 + 9

5 + 5 10 + 10

</td>
</tr>
</table>

YEAR 2	**Multiplication** (2, 5 and 10 times table, rote count only in 3s)	
Vocabulary: Multiplication, multiply, multiple, times, equal groups of, lots of, repeated addition, equal, same, number sentence, calculation, number, numeral, digit, pattern, commutativity, inverse, array, row, column, multiplication tables/facts, once, twice, three, ten…times a big, repeated addition.		
See Year 1 for doubles.		
Concrete	**Pictorial**	**Abstract**
Understand equal groups  There are 4 equal groups of 5 pencils.	**Understand equal groups**  4 groups of 5.	Written mathematical statements and calculations to be shown alongside pictorial representations. However, see below for mental recall. Children to **instantly** recall the **2**, **5** and **10** times tables. Children to understand, **show** and **use** the **inverse** relationship between **multiplication** and **division** e.g. 4 x 10 = 40 4 x □ = 40 10 x 4 = 40 □ x 10 = 40 40 ÷ 10 = 4 40 ÷ □ = 40 40 ÷ 4 = 10 □ ÷ 4 = 40 **Counting on** 7 x 5 = By counting on in the fives pattern using fingers to keep track. **Using doubling and halving:**
Add equal groups: repeated addition How many fingers altogether?  5 + 5 + 5 = 15 	**Add equal groups: repeated addition** 5 + 5 + 5 = 15 	

Counting on:

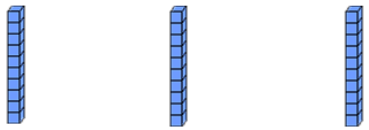
5 + 5 + 5 = 15

Arrays

There are **2** apples in each row.
There are **3** rows.
2 + **2** + **2** = **6**
There are **6** apples altogether.

Groups of

10 **10** **10**

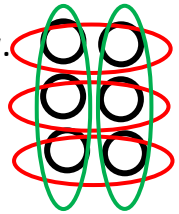


3 groups of 10 = 30
3 lots of 10 = 30 3 x 10 = 30

Jottings
5 x 3 = 15

Arrays

There are **2** in each row.
There are **3** rows.
3 lots of **2**.
2 + **2** + **2** = **6**
3 x 2 = 6
2 x 3 = 6
(commutativity)



Jottings: preferred method

3 x 10 = 30

Bar model:

30		
10	10	10

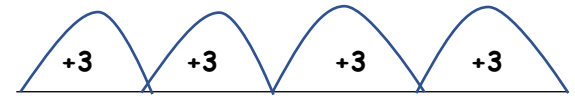
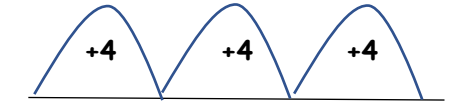
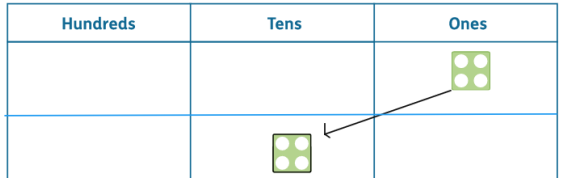
Know corresponding halves of doubles of all numbers to 15 and doubles of all numbers of multiples of 5 to 50.

14 ÷ 2 = 7 (by recalling the doubles first)

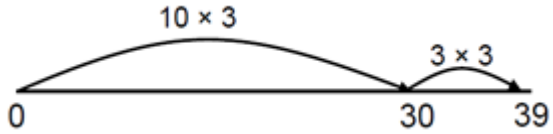
Using known facts and place value:
If 4 ÷ 2 = **2**
Then 40 ÷ 2 = **20**

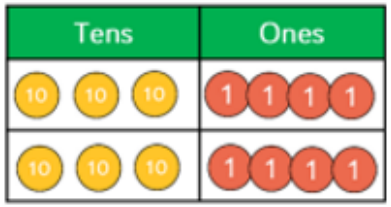
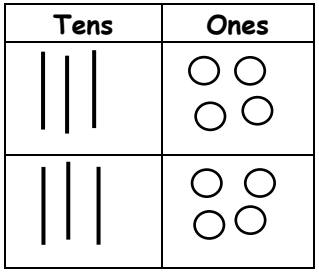
Recognise odd and even numbers:
Explain why 15 is an odd number

Written by C Dasgupta and V Knezevic August 2024

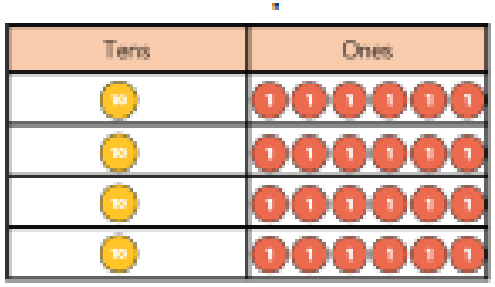
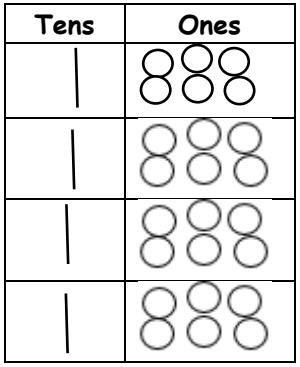
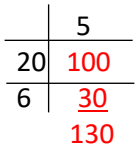
YEAR 3	Multiplication (2, 5, 10, 3, 4, 8)	
Vocabulary: partition, inverse, product, scaling, equal groups of; lots of, array, multiply, multiplied by, times (see previous year groups)		
Concrete	**Pictorial**	**Abstract**
Multiplication tables: (2, 5, 10, 3, 4, 8) 4 x 3 3 x 4 	**Multiplication tables:**  	**Multiplication tables:** (instant mental recall)
X10 and X100 10 x 4  (Move 2 places when x 100 and 2 digit number x2) (Move 2 places when x 100) Also show 2 digit number x 10 e.g. 34 x 10.	**X10 and X100** 10 x 4 H T O 4 4 0 (Move 2 places when x 100)	No written method – leads to a mental method.

<table>
<tr>
<td>Counting on:
(or diennes/numicon/place value counters)
13 x 3
 

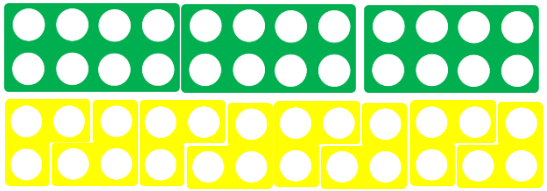
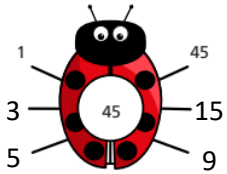
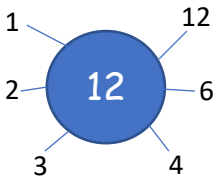
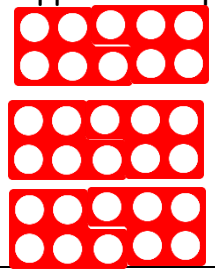
30p 3p 3p 3p = 39p</td>
<td>Counting on:
13 x 3
 

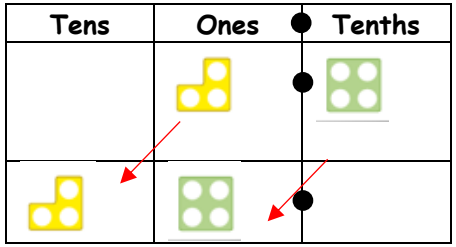
May count on in 1 x 3 instead of 3 x 3 to start.</td>
<td>Counting on:</td>
</tr>
<tr>
<td>2 digit x 1 digit no exchanging:
34 x 2 = 68
Using diennes or place value counters
 
</td>
<td>2 digit x 1 digit no exchanging:
34 x 2 = 68
 
</td>
<td>2 digit x 1 digit no exchanging:
Written – leading to a mental method.

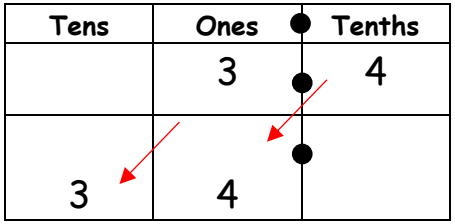
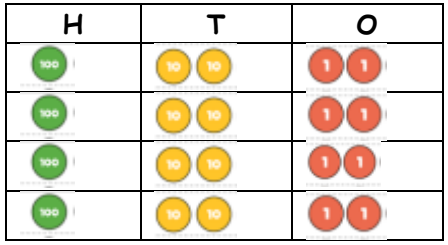
34 x 2 = 68

30 x 2 = 60
4 x 2 = 8
60 + 8 = 68</td>
</tr>
<tr>
<td>2 digit x 1 digit exchanging:
16 x 4
 
</td>
<td>2 digit x 1 digit exchanging:
16 x 4
 
</td>
<td>2 digit x 1 digit exchanging:
(Expanded method)
16
x 4
24 (4 x 6)
40 (4 x 10)
64
<u>Alternative grid method (if needed)</u>
26 x 5
 
</td>
</tr>
</table>

Mental methods		
Instantly recall the multiplication tables for the 2, 5, 10, 3, 4 and 8 times table by the end of year 3. **X10 and x 100:** 10 x 5 = 50 10 x 34 = 340 100 x 3 = 300 **Using known facts and place value:** If 2 x 3 = 6 Then 20 x 3 = 60; 2 x 30 = 60; 20 x 30 = 600 **Doubling:** Recall doubles of all numbers to 20, doubles of multiples of 5 to 100 and doubles of multiples of 100 to 500 24 x 2 = 48 20 x 2 = **40** 4 x 2 = **8** **40 + 8 = 48**	**Doubling again (x4 and x8)** Use doubling to connect 2, 4 and 8 multiplication tables **7 x 4 = 28** 7 x 2 = **14** **14** x 2 = 28 **7 x 8 = 56** 7 x 2 = **14** **14** x 2 = **28** **28** x 2 = 56 **Partitioning:** No exchanging 32 x 3 30 x 3 = **90** 2 x 3 = **6** **90 + 6** = 96	**Continue to understand the inverse relationship between multiplication and division** Write the related number sentences 6 x 3 = 18 3 x 6 = 18 18 ÷ 3 = 6 18 ÷ 6 = 3 Use this knowledge to solve missing number problems involving multiplication. 3 x ___ = 15 24 ÷ ___ = 8 ___ ÷ 4 = 5

YEAR 4	Multiplication (up to 12 x 12)	
Vocabulary: repeated addition, product, lots of, groups of, times, factor, multiple, prime; multiplicand - a quantity which is to be multiplied by another (the multiplier) x multiplier = product;		
Concrete	**Pictorial**	**Abstract**
Recognise and use factor pairs and commutativity in mental calculations Numicon to support factor pairs, commutativity and inverse relationships: **Counting in lots of** 	Area of rectilinear shapes: Use of times table knowledge 3cm Area = 24cm² 8cm **Factor bugs or diagrams:**   	Mental recall of multiplication facts and corresponding division facts. 8 x 3 = 24 3 x 8 = 24 24 ÷ 8 = 3 24 ÷ 3 = 8
Multiplying 3 numbers together Numicon used to support multiplication 5 x 2 x 3 = 10 x 3 = 30 		

<table>
<tr>
<td>x10, x100 and x1000:
(see Year 3 for multiplying whole numbers by 10 and 100)
<u>Place value counters:</u>
3.4 x 10
 

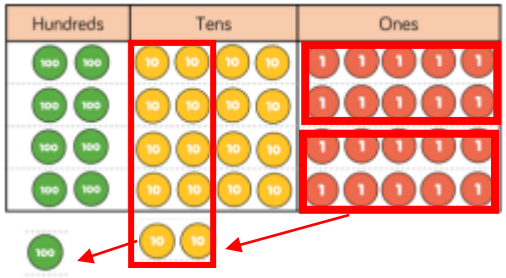
Also x 1000
Understand that x 1000 = 10 x 10 x 10</td>
<td>x10, x100 and x1000:
3.4 x 10
 
</td>
<td>x10, x100 and x1000:
No written method – leads to a mental method.</td>
</tr>
<tr>
<td>2 digit and 3 digit numbers x 1 digit:
(no exchanging) (for 2 digit x 1 digit see year 3)
122 x 4 = 488
 
</td>
<td>2 digit and 3 digit numbers x 1 digit:
(no exchanging) (for 2 digit x 1 digit see year 3)</td>
<td>Written – leading to a mental method.
2 digit and 3 digit numbers x 1 digit:
(no exchanging) (for 2 digit x 1 digit see year 3)
122 x 4 = 488

100 x 4 = 400
20 x 4 = 80
2 x 4 = 8

400 + 80 + 8 = 488</td>
</tr>
</table>

2 digit and 3 digit numbers x 1 digit: (exchanging) (for 2 digit x 1 digit see year 3)

245 x 4 = 980



9 hundreds 8 tens 0 ones

2 digit and 3 digit numbers x 1 digit: (exchanging) (for 2 digit x 1 digit see year 3)

2 digit and 3 digit numbers x 1 digit: (exchanging) (for 2 digit x 1 digit see year 3)

245 x 4 =

Expanded leading to **Compacted**

	H	T	O	
	2	4	5	
X			4	
		2	0	(5 x 4)
	1	6	**0**	(40 x 4)
+	8	**0**	**0**	(200 x 4)
	9	8	0	

	H	T	O
	2	4	5
x			4
	9	8	0
	1	2	

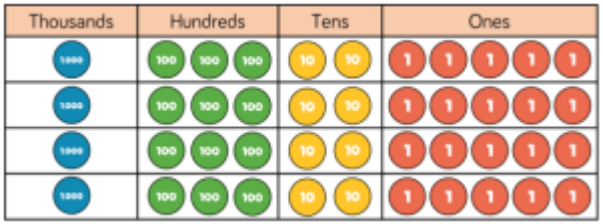
Alternative grid method (if needed)

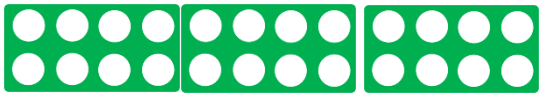
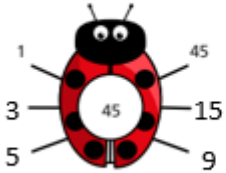
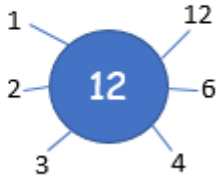
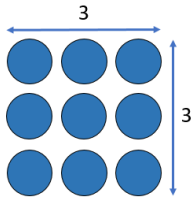
127 x 6 = 762

x	100	20	7
6	600	120	42

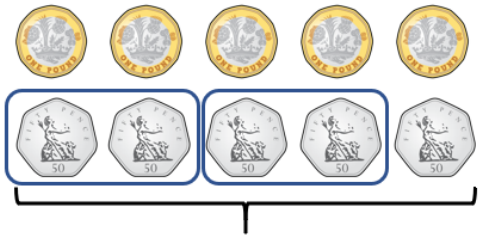
600 + 120 + 42 = 762 (add the partial products)

Mental Methods		
Number facts: Count in multiples of 6, 7, 9, 25 and 1000 Instantly recall the multiplication tables up to 12 x 12. Multiply mentally using place value, known and derived facts, including: multiplying by 0 and 1 **X10, x 100 and x1000:** 10 x 5 = 50 10 x 34 = 340 100 x 3 = 300 1000 x 5 = 5000 **Partitioning: (using distributive law)** 53 x 6 50 x 6 = **300** 3 x 6 = **18** **300 + 18 = 318**	**Doubling:** Derive doubles of multiples of 50 to 1000 and multiples of 1000 35 x 8 (double, double and double again) Double 35 is 70, double 70 is 140, double 140 is 280. **Using known facts and place value:** Multiply by 10 and then halve to x 5: 73 x 10 = 730 So 73 x 5 = Half of 730 = **365** 24 x 10 = 240 So 24 x 9 = **216** (by subtracting 24 from 240) 800 x 6 8 x 6 = 48 So 800 x 6 = **4800**	**Using factors** Recognise factor pairs. 15 x **6** = 15 x **3 x 2** 15 x 3= 45 45 x 2 = 90 **Continue to understand the inverse relationship between multiplication and division** Write the related number sentences 6 x 7 = 42 7 x 6 = 42 42 ÷ 7 = 6 42 ÷ 6 = 7 Use this knowledge to solve missing number problems involving multiplication. 3 x ___ = 15 25 + 10 = 5 x ___ 15 < ___ x 2 ___ x ___ > 20

YEAR 5	Multiplication	
Vocabulary: product, lots of, groups of, times, as much, factor, multiple, prime, square, cube (see previous year groups)		
Concrete	Pictorial	Abstract
Numicon to support basic times tables facts: e.g. 1223 x 6 = Numicon used to support 3 x 6  (start with no exchanging leading to exchanging) 1325 x 4  (if needed)	Area of rectilinear shapes: 12cm Area = 276cm² 23cm	Multiply 4-digit by 1-digit (expanded) Th H T O 1 2 5 4 X 7 2 8 (4 x 7) 3 5 0 (50 x 7) 1 4 0 0 (200 x 7) 7 0 0 0 (1000 x 7) 8 7 7 8 Multiply 4-digit by 1-digit (compact) Th H T O 1 2 5 4 X 7 8 7 7 8 1 3 2 Multiply 4-digit by 2-digit TTh Th H T O 1 2 5 4 X 1 3 1 1 3 7 6 2 (1254 x 3) 1 2 5 4 0 (1254 x 10) 1 6 3 0 2 1 1

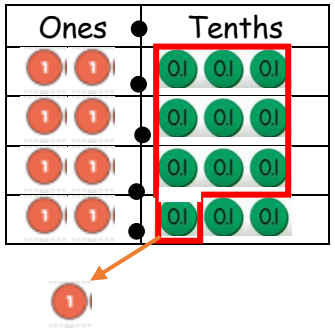
Recognise and use factor pairs and commutativity in mental calculations Numicon to support factor pairs, commutativity and inverse relationships: **Counting in lots of**  **3 x 8 = 24** 8 x 3 = 24	**Factor bugs or diagrams:**   Prime numbers: 	No written method
Square and cube numbers 3 x 3 = 9  3 x 3 x 3 = 27 	**Drawing of arrays to support understanding of square numbers:** 	No written method

<table>
<tr>
<td><u>Multiplying decimals in the context of measure</u>

£1.50 × 5 = £7.50
(£1 × 5) + (£0.50 × 5)
 
£0.50 × 5 = £2.50</td>
<td></td>
<td><u>Partitioning</u>

1.5 x 5 = 6.5
1 0.5

1 x 5 = 5
0.5 x 5 = 2.5

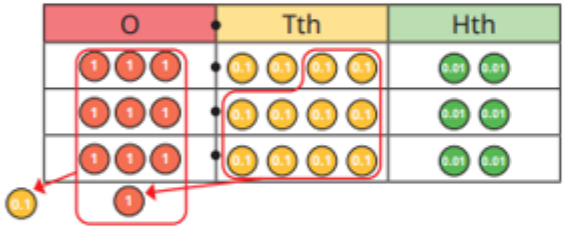
4 + 2.5 = 6.6</td>
</tr>
<tr>
<td>Multiply numbers with up to one decimal place by one-digit whole number.
Exchanging:
2.3 x 4
 

Start with no exchanging leading onto exchanging.</td>
<td>Multiply numbers with up to one decimal place by one-digit whole number.</td>
<td>Multiply numbers with up to one decimal place by one-digit whole number.
2.3 x 4 = 9.2
1 2
8 0
9 2

2.3 x 4 = 9.2
1

Alternative grid method:
<table>
<tr><td>X</td><td>4</td></tr>
<tr><td>2.0</td><td>8.0</td></tr>
<tr><td>0.3</td><td>1.2</td></tr>
</table>
8.0 + 1.2 = 9.2
Leads on to a mental method (see below)</td>
</tr>
</table>

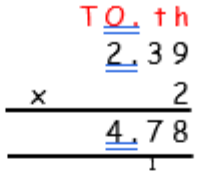
Mental Methods		
Number facts Use knowledge of counting in multiples to count in decimals steps (one decimal place) 0.6, 1.2, 1.8, 2.4 … 8.4, 7.7, 7, 6.3 … Derive doubles of decimals (to one decimal place) using knowledge of place value Double 0.4 = 0.7 x 2 = Double 3.8 = 5.6 + 5.6 = **Doubling and halving** 3.7 x 4 (double and double again)	**Times Tables** Continue to recall multiplication facts for multiplication tables up to 12 x 12 fluently, and derive and use related facts. **Multiples and factors** Identify multiples and factors, and common factors of two numbers. • List the factors of 96 • Identify the common factors of 30 and 36 by listing factor pairs Establish whether a number up to 100 is prime and recall primes up to 19; find prime factors.	**Partitioning** All times tables fact up to 12x12 should be easily recalled. Children to multiply 2 digit by 1 digit numbers mentally by partitioning: 23 x 6 = 78 20 3 20 x 3 = 60 6 x 3 = 18 60 + 18 = 78 **Estimating and checking** Check 86 x 9 by using and equivalent calculation. Multiply by 10 and adjust (860-86) or partition (80x9 added to 6x9)

YEAR 6	Multiplication	
Vocabulary: multiply, multiplication, factor, product, multiple, times, groups, inverse, squared, cubed, multiplier, multiplicand, scaling		
Concrete	**Pictorial**	**Abstract**
Numicon to support basic times tables facts: e.g. 1223 x 6 = Numicon used to support 3 x 6  3.42 x 3  	Gattegno chart for showing powers of 10, 100 etc (Chart can be extended to include decimal numbers)	Multiply 4-digit by 1-digit (compact) Th H T O 1 2 5 4 X 7 8 7 7 8 1 3 2 Multiply 4-digit by 2-digit Th H T O 1 2 5 4 X 1 3 3 7 6 2 (1254 x 3) 1 2 5 4 0 (1254 x 10) 1 6 3 0 2 1 1 Children need to be able to show remainders in different ways, e.g. decimal, fraction
Concrete materials to support understanding of cubed numbers 3 x 3 = 9   3 x 3 x 3 = 27	**Images to support understanding of square and cube numbers** 2^2 Two squared 2 × 2  2^3 Two cubed 2 × 2 × 2  = 8	

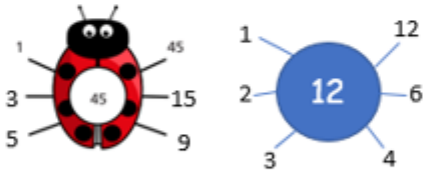
<table>
<tr>
<td>Multiply one digit numbers with up to two decimal places by whole numbers (including scaling)

2.39 x 2 = 4.78

Numicon to support with multiplying if needed.

e.g. 9 x 2
  </td>
<td>Multiplying decimals involving measures
Exchange 50p to £1
£1.50 × 5 = £7.50
(£1 × 5) + (£0.50 × 5)
 
£0.50 × 5 = £2.50</td>
<td>Multiplying decimals
 
</td>
</tr>
<tr>
<td>Recognise and use factor pairs and commutativity in mental calculations
Numicon to support factor pairs, commutativity and inverse relationships:

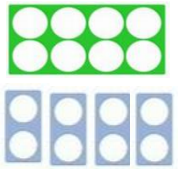
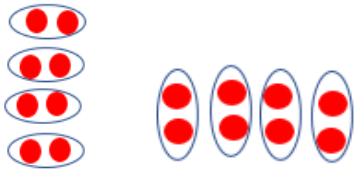
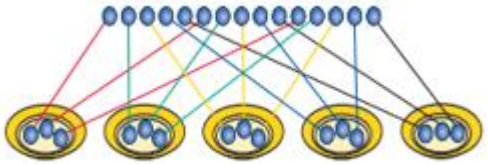
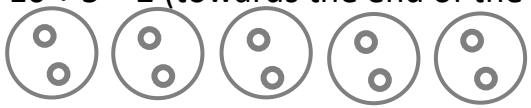
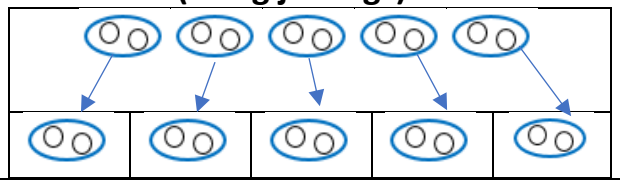
<u>Counting in lots of</u>
 
3 x 8 = 24

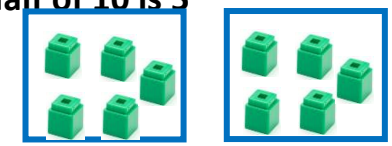
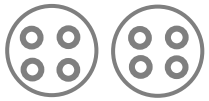
8 x 3 = 24</td>
<td><u>Factor bugs or diagrams:</u>
 

Prime numbers:
 
</td>
<td>No written method</td>
</tr>
</table>

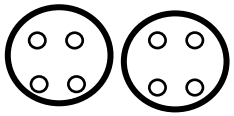
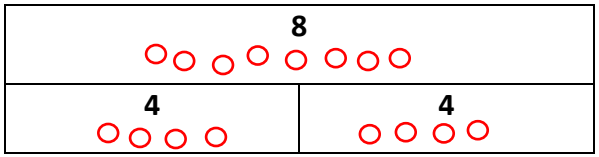
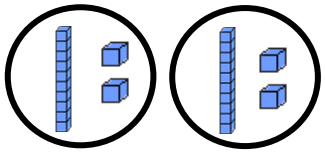
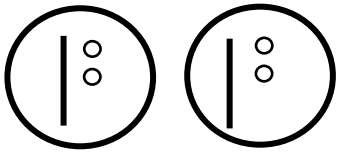
Mental Methods		
Number facts Use knowledge of counting in multiples to count in decimals steps (one decimal place) 0.6, 1.2, 1.8, 2.4 … 8.4, 7.7, 7, 6.3 … Derive doubles of decimals (to one decimal place) using knowledge of place value Double 0.4 = 0.7 x 2 = Double 3.8 = 5.6 + 5.6 = **Doubling and halving** 3.7 x 4 (double and double again)	**Times Tables** Continue to recall multiplication facts for multiplication tables up to 12 x 12 fluently, and derive and use related facts. **Multiples and factors** Identify multiples and factors, and common factors of two numbers. • List the factors of 96 • Identify the common factors of 30 and 36 by listing factor pairs Establish whether a number up to 100 is prime and recall primes up to 19; find prime factors.	**Partitioning** All times tables fact up to 12x12 should be easily recalled. Children to multiply 2 digit by 1 digit numbers mentally by partitioning: 23 x 6 = 78 20 3 20 x 3 = 60 6 x 3 = 18 60 + 18 = 78 **Estimating and checking** Check 86 x 9 by using and equivalent calculation. Multiply by 10 and adjust (860-86) or partition (80x9 added to 6x9)

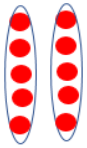
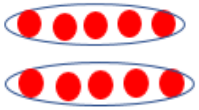
Division

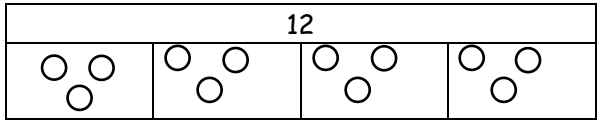
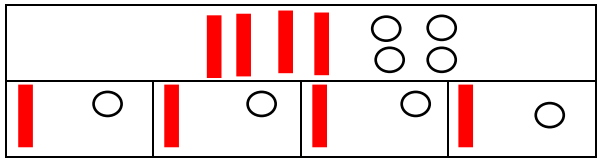
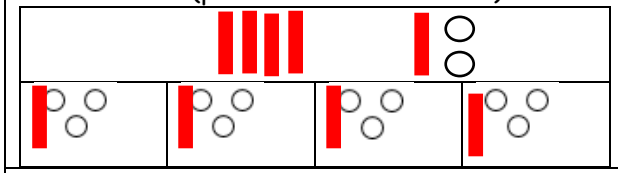
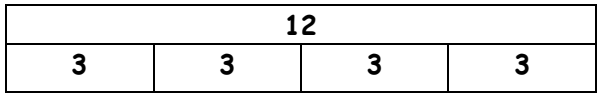
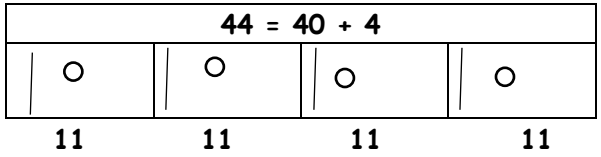
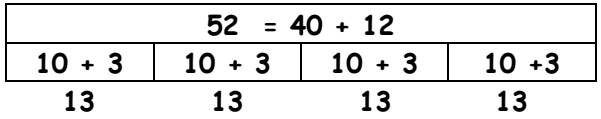
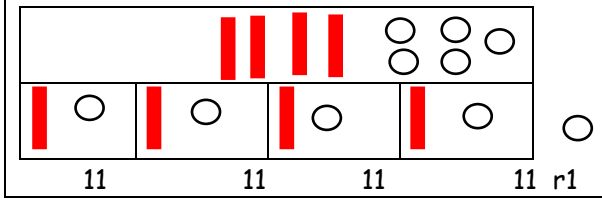
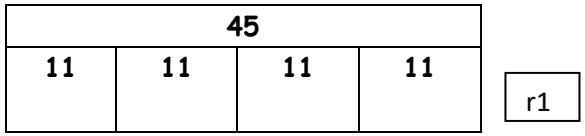
YEAR 1	Division	
Vocabulary: Divide, division, ones, group, groups, equal groups of, lots of, halving, array, row, column, lots of, pattern, share, share equally, number, numeral, one each, 2 each, etc.		
Concrete	**Pictorial**	**Abstract**
See Year 1 multiplication for counting in equal groups of 2, 5 and 10.		
Making equal groups: Start with recognising when groups are equal. Equal groups of 2, 5 and 10 **Objects** **Cubes/dienes** **Numicon** 	**Making equal groups:** **(Arrays)**  **Rows** **Columns**	**Making equal groups:** Children record their mathematical knowledge and skills using pictorial representations, arrays, jottings and mathematical statements.
Sharing: 15 ÷ 5 = 3 **15** shared between **5** **Counters/cubes/dienes**  Encourage one to one correspondence.	**Sharing** (jottings) preferred method **10 shared between 5 is 2** 10 ÷ 5 = 2 (towards the end of the unit)  **Bar model (using jottings):** 	**Sharing:** Children record their mathematical knowledge and skills using pictorial representations, arrays, jottings and mathematical statements.

Halving: (Making the link between shared between 2, ÷ 2 and the fraction ½). **Concrete objects: cubes** **Half of 10 is 5**  **10 shared between 2 is 5** (10 ÷ 2 = 5) **Beads** Half of 6 is 3 6 shared between 2 is 3 (6 ÷ 2 = 3)  **Numicon:**  	**Halving:** Jottings **<u>Half of 8</u>** (8 ÷ 2) 	Leads on to instant mental recall.

Mental	
<u>Number facts:</u> Experience <u>regular counting</u> on and back from different numbers in 1s and in multiples of 2, 5 and 10. Count a set of objects by grouping in 2s, 5s or 10s (*Count these pennies (2 at a time))*	**<u>Using doubling and halving:</u>** Know corresponding halves of doubles. Half of 6 is ☐ Half of 10 is ☐

YEAR 2	**Division** (2, 5 and 10)	
Vocabulary: division, divided by, share, shared between, equal, groups, same, number sentence, calculation, number, numeral, digit, pattern, inverse, jottings.		
Concrete	**Pictorial**	**Abstract**
Equal groups – sharing (÷2, 5 and 10)  **12 cubes** shared equally between **2** is 6 Dienes  25 shared between 5 equals 5.	**Equal groups – sharing** **Jottings - preferred method:**  **8** shared between **2** is **4** **8 ÷ 2 = 4** **Bar model:**  	Written mathematical statements and calculations to be shown alongside pictorial representations. However, see below for mental recall. **Mental** **Number facts** Count regularly, on and back, in steps of 2, 3, 5 and 10 from 0. Instantly recall the **2**, **5** and **10** times tables. Understand, show and use the **inverse** relationship between **multiplication** and **division** e.g. **4 x 10 = 40** **4 x □ = 40** **10 x 4 = 40** **□ x 10 = 40** **40 ÷ 10 = 4** **40 ÷ □ = 40** **40 ÷ 4 = 10** **□ ÷ 4 = 40** **Using doubling and halving:** Know corresponding halves of doubles of all numbers to 15 and doubles of all numbers of multiples of 5 to 50.
Halving and sharing 24 ÷ 2 = 12 (link to fractions) **Dienes** 	**Halving and sharing** **Jottings** 24 ÷ 2 = 12 	

Equal groups – grouping 10 ÷ 2= 5 **Cubes**  There are 2 groups of 5 sweets. **Bead string** 15 ÷ 3 = 5 	**Equal groups – grouping** 10 ÷ 2 = 5 **Arrays:**   As **columns** OR as **rows**	14 ÷ 2 = 7 (by recalling the doubles first) **Using known facts and place value:** If 4 ÷ 2 = **2** Then 40 ÷ 2 = **20** **Recognise odd and even numbers:** Explain why 15 is an odd number

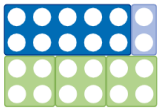
Year 3	Division (by 3, 4 and 8)	
Vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, row, column, equal groups of, group in pairs, 3s … 10s, equal groups of, divide, ÷, divided by, divided into, remainder, left over, inverse, in every,		
Concrete	**Pictorial**	**Abstract**
Sharing (using dienes/place value counters/ numicon and bar model) **12 ÷ 4 = 3**  **44 ÷ 4 = 11**  **52 ÷ 4 = 13** (partition into 40 and 12) 	**Sharing** (using jottings moving onto numbers) **12 ÷ 4**  **44 ÷ 4**  **52 ÷ 4**  	Written No written method. **Sharing method eventually links with fractions.**
Remainders: **Sharing** **45 ÷ 4 = 11r1**  	**Remainders:** **Sharing** **45 ÷ 4 = 11r1**  	

Grouping

30 ÷ 6 = 5

Link with 5 x 6 = 30

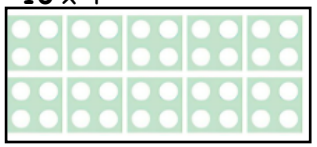
12 ÷ 4 = 3



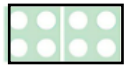
Can be developed into number line being drawn over numicon to help.

48 ÷ 4 = 12

10 x 4



2 x 4

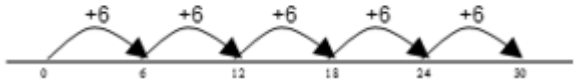


Grouping - drawn with numicon out

30 ÷ 6 = 5

How many 6's are in 30?

30 ÷ 6 can be modelled as:

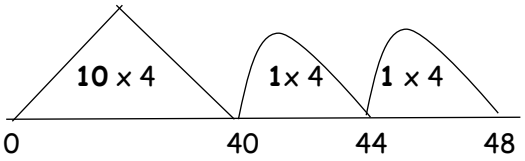


1 group 1 group 1 group 1 group 1 group

1 x 6 1 x 6 1 x 6 1 x 6 1 x 6

30				
6	6	6	6	6

48 ÷ 4 = 12

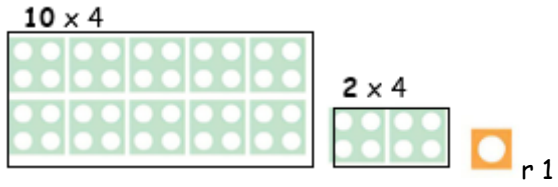


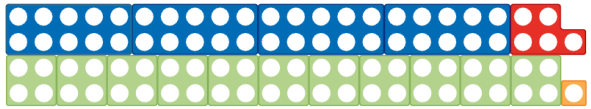
48		
40	4	4

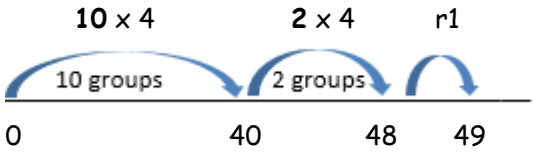
Written

No written method.

<table>
<tr>
<td>Remainders:
<u>Grouping</u>
49 ÷ 4 = 12r1

45 ÷ 4 = 11 r1
  </td>
<td>Remainders:
<u>Grouping</u>
49 ÷ 4 = 12r1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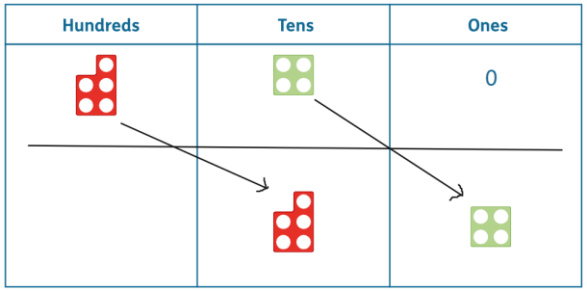
<td></td>
</tr>
<tr>
<td>÷10 and ÷100
540 ÷ 10 = 54
 

(also multiple of 100 ÷ 10 and ÷ 100)</td>
<td>÷10 and ÷100
540 ÷ 10 = 54

<table>
<tr><th>H</th><th>T</th><th>O</th></tr>
<tr><td>5</td><td>4</td><td>0</td></tr>
<tr><td></td><td>5</td><td>4</td></tr>
</table>

(also multiple of 100 ÷ 10 and ÷ 100)</td>
<td><u>÷10 and ÷100:</u>
Mentally

50 ÷ 10 = 5
200 ÷ 10 = 20
200 ÷ 100 = 2</td>
</tr>
</table>

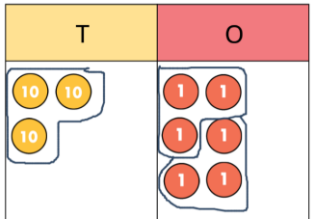
Mental	
Using known facts and place value: If 6 ÷ 2 = 3 Then 60 ÷ 2 = 30; 600 ÷ 2 =300 **Halving:** 44 ÷ 2 = 22 **Halve and halve again:** 44 ÷ 4 = 44 ÷ 2 = 22 22 ÷ 2 = 11 **Using the inverse:** If 4 x 8 = 32 32 ÷ 4 = 8 32 ÷ 8 = 4	**Partitioning:** No exchanging 69 ÷ 3 = 23 60 ÷ 3 = **20** 9 ÷ 3 = **3** **20 + 3 = 23** **Partitioning in different ways:** 42 ÷ 3 Partition into different tens and ones to support division. 30 + 12 (both divisible by 3)

YEAR 4	Division
Vocabulary: divide, divided by, divisible by, divided into, share between, groups of, factor, factor pair, multiple, times as (big, long, wide …etc), for every, equals, remainder, quotient, divisor, inverse	

Concrete

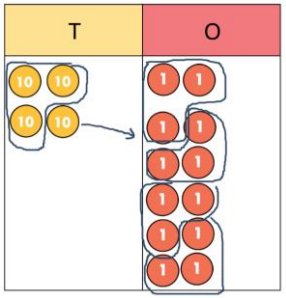
Divide a 2 digit number by a 1 digit number

36 ÷ 3 = 12



1 2

42 ÷ 3 = 14



1 4

1 ten has been exchanged for 10 ones.

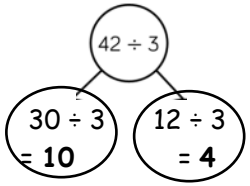
Extend to include remainders.

Pictorial

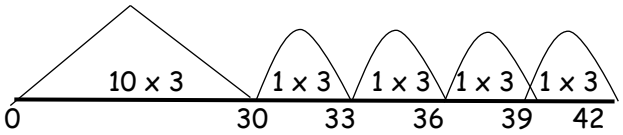
Divide a 2 digit number by a 1 digit number

Start with simple partitioning (36 ÷ 3) then:

42 ÷ 3



OR



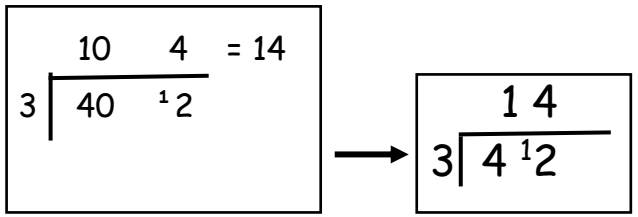
10 + 4 = 14 (moving on to jumps of 4 x 3)

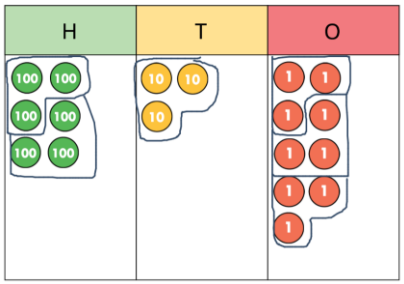
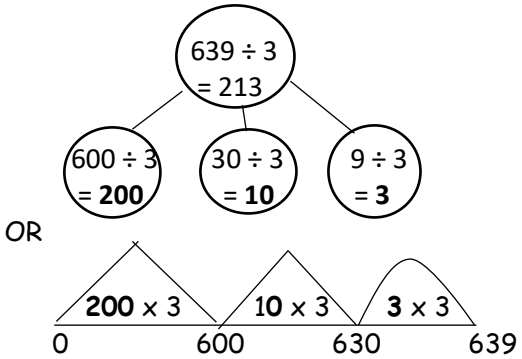
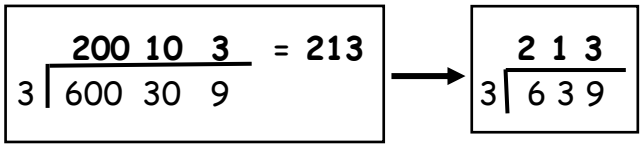
Abstract

Divide a 2 digit number by a 1 digit number

Start with simple partitioning (36 ÷ 3) then:

42 ÷ 3

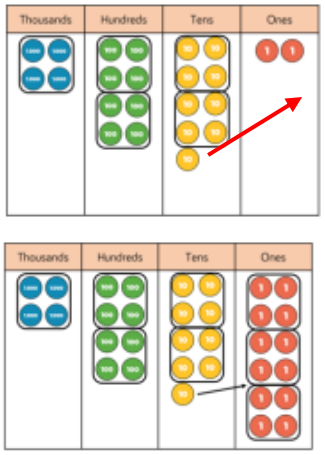
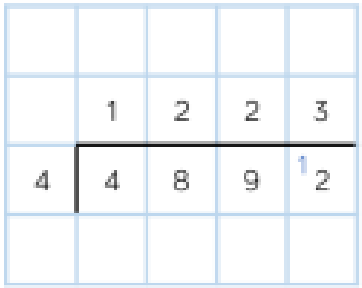
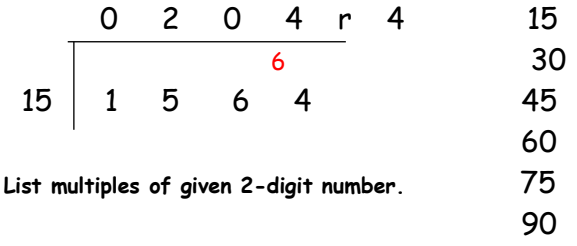


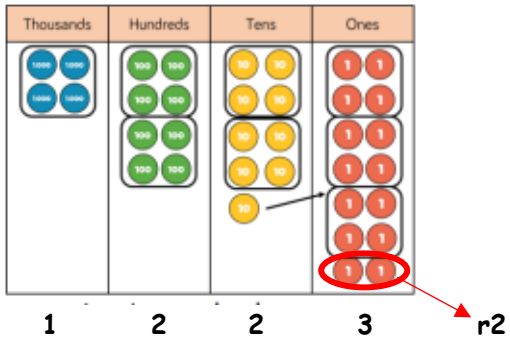
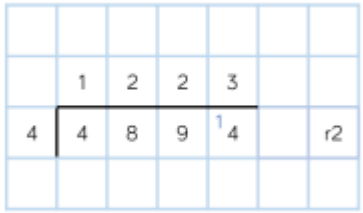
Divide a 3 digit number by a 1 digit number (no exchanging) 639 ÷ 3  	**Divide a 3 digit number by a 1 digit number (no exchanging)** 639 ÷ 3  	**Divide a 3 digit number by a 1 digit number (no exchanging)** 639 ÷ 3 

Mental Methods

Number facts: Count on and back in multiples of 6, 7, 9, 25 and 1000. 0 7 14 21 28 … 300 275 250 225 200 … Learn the multiplication facts to 12 x 12 and use place value to derive related facts. 6 x 7 = 42 70 x 6 = 420 42 ÷ 6 = 7 420 ÷ 6 = 70 How many sixes in 54? Divide 63 by 7 350 divided by 5 108 ÷ 12, what is the quotient?	**Doubling and halving** Derive corresponding halves of doubles of multiples of 50 to 1000 and multiples of 1000. Half of 150 is __ 700 ÷ 2 = __ 6000 ÷ 2 = __ **600 ÷ 4** (halve & halve again) Half of 600 is 300, half of 300 is **150** **112 ÷ 8** (halve, halve and halve again) Half of 112 = 56, half of 56 = 28, half of 28 = **14** **Using known facts and place value:** If 6 ÷ 2 = 3 Then:	**Partitioning:** Continue to partition 2 and 3 digit numbers in different ways: 762 = 700 + 60 + 2 762 = 600 + 120 + 42 etc **Without crossing the tens boundary:** 78 ÷ 6 = **13** Partition in to multiples of the divisor 60 ÷ 6 = **10;** 18 ÷ 6 = **3** **10 + 3 = 13** **Crossing the tens boundary:** 185 ÷ 5 = **37** 150 ÷ 5 = **30**; 35 ÷ 5 = **7** **30 + 7 = 37**

Inverse: Write the related number sentences 6 x 7 = 42 7 x 6 = 42 42 ÷ 7 = 6 42 ÷ 6 = 7	60 ÷ 20 = 3, 600 ÷ 3 = 200 etc. **Using factors** Recognise and use factor pairs List the factor pairs of 32 500 ÷ 20 (Divide 500 by 10 then divide by 2) 90 ÷ 6 (Divide 90 by 3 then divide by 2)	With remainders: 187 ÷ 5 (using jottings – see above)

YEAR 5	Division	
Vocabulary: common factors, prime number, prime factors, composite numbers, short division, square number, cube number, inverse, power of. (see previous year groups)		
Concrete	Pictorial	Abstract
Divide numbers up to 4 digits by a one-digit number (no remainders) (start with 4d ÷ 1d no exchanging e.g. 4848 ÷ 4) 4892 ÷ 4 = 1223  **1 2 2 3** Children to display remainder in different ways. E.g. r 4 or $\frac{4}{5}$ In some examples, children should recognise some simple decimals. E.g. if quotient is $23\frac{3}{4}$, children should recognise it can also be expressed as 23.75	**Divide numbers up to 4 digits by a one-digit number (no remainders)**	**Divide numbers up to 4 digits by a one-digit number (no remainders)** 4892 ÷ 4  **Divide numbers up to four digits by two-digit numbers.** 

<table>
<tr>
<td>Divide numbers up to 4 digits by a one-digit number (with remainders)
Display remainder in different ways e.g. r 4 or $\frac{4}{5}$
In some examples, recognise some simple decimals e.g. if quotient is $23\frac{3}{4}$, recognise it can also be expressed as 23.75
4892 ÷ 4 = 1223
 
</td>
<td>Divide numbers up to 4 digits by a one-digit number (with remainders)</td>
<td>Divide numbers up to 4 digits by a one-digit number (with remainders)
Divide numbers up to 4 -digits by a 1-digit number using a formal written method (short division) and interpret remainders appropriately for the context
4892 ÷ 4 = 1223
 
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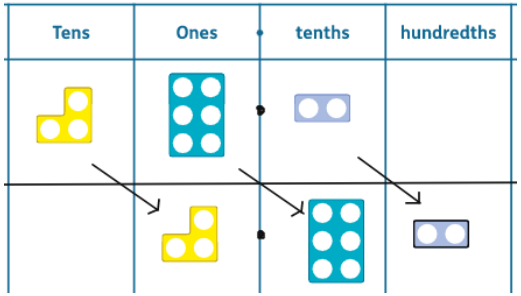
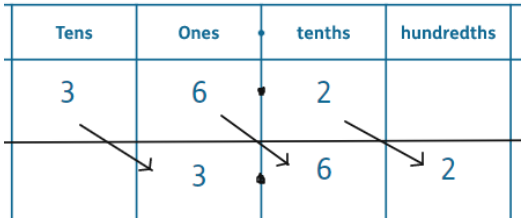
</tr>
<tr>
<td>Divide whole numbers and those involving decimals by 10, 100 and 1000

Numicon/place value counters:

36.2 ÷ 10 = 3.62
 
</td>
<td>Divide whole numbers and those involving decimals by 10, 100 and 1000

36.2 ÷ 10 = 3.62
 
</td>
<td>Divide whole numbers and those involving decimals by 10, 100 and 1000

No written method – mental method only.</td>
</tr>
</table>

Mental Methods

Number facts

Count regularly using a range of multiples, and powers of 10, 100 and 1000, building fluency.

Practice and apply the multiplication facts to 12 x 12.

Use knowledge of counting in multiples to counting in decimal steps (one decimal place).

0.6 1.2 1.8 2.4 ….

Derive corresponding halves of doubles of decimals (to 1 place) using knowledge of place value.

Half of 0.4 = 0.2 3.6 ÷ 2 = 1.8

Continue to recall division facts for multiplication tables to 12 x 12 fluently and derive and use related facts:

560 divided by 7 divide 2.1 by 7

4500 ÷ 5, what is the quotient?

3.2 divided by 4

Identify multiples and factors and common factors of two numbers and primes.

list the multiples of 9 between 150 and 180 (using tests of divisibility)

Using known facts and place value

8.4 ÷ 7 (multiply dividend by 10, then divide quotient by 10) 84÷7 =12, 12÷10=1.2

Mental methods and jottings

Divide mentally drawing upon known number facts.

Use factors to construct equivalence statements.

Begin to divide tenths and 1-digit whole numbers and tenths by 1-digit whole numbers.

Partitioning

Using distributive law:

546 ÷ 6

(540 ÷ 6 = **90**; 6 ÷ 6 = **1** so **90 + 1 = 91**)

With Jottings

24.5 ÷ 7

21 ÷ 7 = **3**; 3.5 ÷ 7 = **0.5**

so **3 + 0.5 = 3.5**

Continue to partition number in different ways:

762 = 700 + 60 + 2;

762 = 600 + 120 + 42 etc

Doubling and halving

14.8 ÷ 4 (halve and halve again)

Half of 14.8 = 7.4; half of 7.4 = 3.7

With jottings:

3800 ÷ 50 (divide by 100 then double)

3800 ÷ 100 = 38; double 38 = 76.

Factors

84 ÷ 20 (halve and divide by 10)

84 ÷2 = 42 then 42 ÷ 10 = 4.2

With jottings

150 ÷ 6

(150 ÷ 3 = 50 then 50 ÷ 2 = 25).

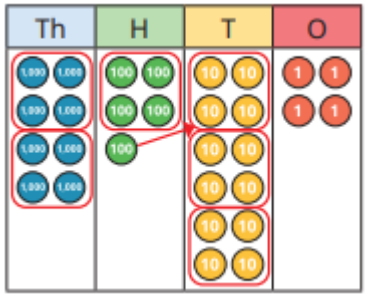
Estimating

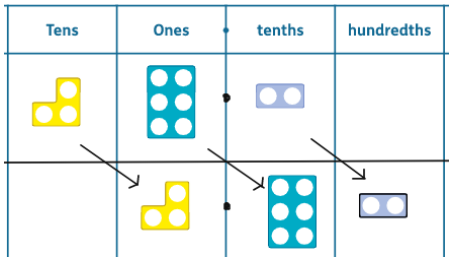
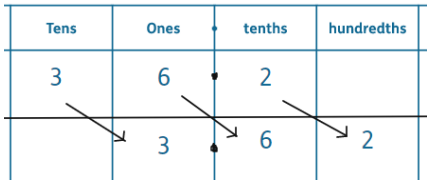
Use rounding to check answers to calculation and determine, in the context of a problem, levels of accuracy:

256 ÷ 12 is approximately 2560 ÷ 10.

Continue to use appropriate strategies to check answers:

Check 860 ÷ 9 by using the inverse.

YEAR 6	Division	
Vocabulary: common factors, prime number, prime factors, composite numbers, short division, square number, cube number, inverse, power of. (See previous year groups)		
Concrete	Pictorial	Abstract
Divide numbers up to 4 digits by two-digit numbers Divide numbers up to 4 -digits by a 2-digit number using a formal written method (short division) and interpret remainders appropriately for the context 8524÷ 4 = 2131  	**Divide numbers up to 4 digits by two-digit numbers**	**Divide numbers up to 4 digits by two-digit numbers** See below for written methods
<u>Short Division</u> 496 ÷ 11 becomes 4 5 r 1 1 1 | 4 9 6 5 Answer: $45\frac{1}{11}$	**<u>Long Division with remainders as fractions</u>** 432 ÷ 15 becomes 2 8 r 12 1 5 | 4 3 2 3 0 0 1 3 2 1 2 0 1 2 Answer: $28\frac{12}{15}$	**<u>Long Division with remainders as decimals</u>** 432 ÷ 15 becomes 2 8 · 8 1 5 | 4 3 2 · 0 3 0 1 3 2 1 2 0 1 2 0 1 2 0 0 Answer: 28·8

Divide whole numbers and those involving decimals by 10, 100 and 1000	Divide whole numbers and those involving decimals by 10, 100 and 1000	Divide whole numbers and those involving decimals by 10, 100 and 1000
36.2 ÷ 10 = 3.62  Use of manipulatives (numicon or place value counter) to show movement of digits across the columns.	36.2 ÷ 10 = 3.62  	No written method – mental method only.

Mental Methods (as with Year 5)

Number facts Use knowledge of counting in multiples to counting in decimal steps (two decimal places). 0.09 0.18 0.27 0.36 … Continue to recall division facts for multiplication tables to 12 x 12 fluently and derive and use related facts: *3000 divided by 60 divide 0.12 by 6* *5800 ÷ 6, what is the quotient?* *0.64 divided by 8* **Using known facts and place value:** 0.99 ÷ 11 (multiply dividend by 100, then divide quotient by 100) *99 ÷ 11 = 9, 9 ÷ 100 = 0.09*	**Mental methods and jottings** Divide mentally drawing upon known number facts. Use factors to construct equivalence statements. Begin to divide hundredths, tenths and 1-digit whole numbers and tenths by 1 and 2-digit whole numbers. **Partitioning** Using distributive law: 5466 ÷ 6 (5400 ÷ 6 = **900**; 60 ÷ 6 = **10**; 6 ÷ 6 = **1** so **900 + 10 + 1 = 911**) **Halving:**	**Factors** 84 ÷ 20 (halve and divide by 10) 84 ÷2 = 42 then 42 ÷ 10 = 4.2 With jottings 888 ÷ 24 = 888 ÷ 8 ÷ 3 **Estimating** Use rounding to check answers to calculation and determine, in the context of a problem, levels of accuracy: 4560 ÷ 19 is almost 4560÷ 20 Continue to use appropriate strategies to check answers: **Inverse** Check by using the inverse.

Identify multiples and factors and common factors of two numbers and primes. Use tests of divisibility to decide whether the answer will have a remainder	Derive corresponding halves of decimals (to 2 places) using knowledge of place value. Half of 0.48 is ☐ 0.74÷2=☐	If 4560 ÷ 19 = 240 then 240 x 19= 4560