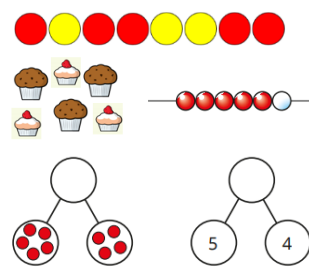
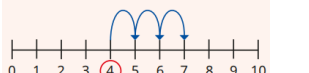
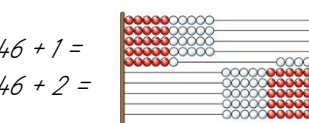
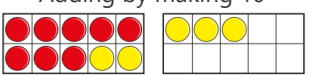
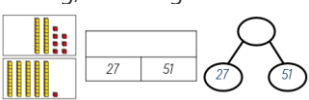
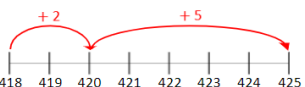
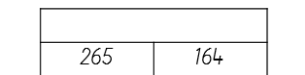
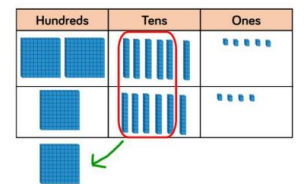
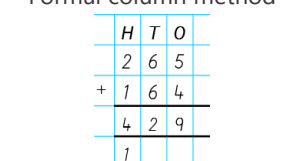
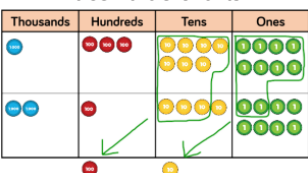
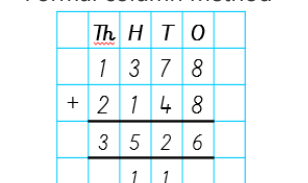
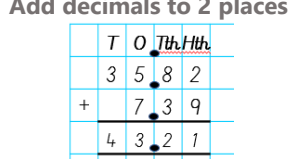
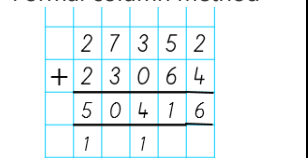
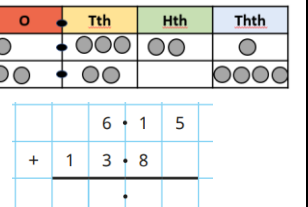
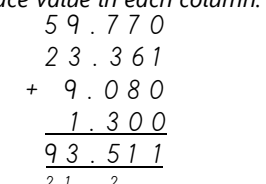




Addition

Fluency, Reasoning and Problem Solving

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6						
Add numbers within 10 and within 20 Introduce part whole models. --- is a part, --- is a part. The whole is ---.  Complete fact families $5 + 1 = 6$ $6 = \dots + 5$ $\dots + 1 = 6$ $\dots + \dots = 6$ Number bonds within 10 Number bonds to 10  Adding using concrete objects, number lines and finding doubles.  Encourage number in head and count on. 	Number bonds Building fluency and instant recall of bonds to 10 and 20. Add 1 and 2-digit numbers to 100 Related facts  If I know that $3 + 4 = 7$ then I know that $30 + 40 = 70$. Adding ones Use concrete objects, pictures and word problems  Adding by making 10  $9 + 5 = 10 + 3$ Adding, including across tens  Add three 1-digit numbers  $7 + 5 + 2 = \dots$	Add numbers with up to 3 digits Continue to use number bonds and part-whole models. Dienes moving onto place value counters. Partitioning and number-lines. $418 + 7 = 425$ 7 can be partitioned into 2 and 5  Bar models  Place value charts  Formal column method  Add decimals as money $\pounds 2.50 + \pounds 1.25 = \pounds 3.75$	Add numbers with up to 4 digits Continue to use part-whole models, number lines and bar models. Dienes, place value counters, including decimals Estimation by rounding to the nearest 10, 100, 1000 $2364 + 3521 =$ $2360 + 3520 = 5880$ $2400 + 3500 = 5900$ $2000 + 4000 = 6000$ Place value charts  Formal column method  Add decimals to 2 places 	Add numbers with more than 4 digits Continue to use part-whole models, number lines and bar models. Place value counters and plain counters Mental strategies If $5 + 3 = 8$, then I know $500,000 + 300,000 = 800,000$ $26,480 + 2,999 =$ $2,999 + 1 = 3,000$ $26,480 + 3,000 = 29,480$ I then subtract 1 to get the answer 29,479 Formal column method  Checking strategies: Estimate by rounding $27000 + 23000 = 50000$ Add decimals to 3 places 	Add integers with increasing complexity Children should be encouraged to use the abstract to add efficiently, although concrete resources can still provide support. Mental strategies Which calculations would you work out mentally, and which would you work out using the column method? <table><tr><td>$67,832 + 5,258$</td><td>$834,501 - 299,999$</td><td>$450,000 + 201,000$</td></tr><tr><td>$8 \text{ million subtract } 3\frac{1}{2} \text{ million}$</td><td>$604,000 - 25,000$</td><td></td></tr></table> Add decimals to 3 places Empty decimal places should be filled with zero to show place value in each column. 	$67,832 + 5,258$	$834,501 - 299,999$	$450,000 + 201,000$	$8 \text{ million subtract } 3\frac{1}{2} \text{ million}$	$604,000 - 25,000$	
$67,832 + 5,258$	$834,501 - 299,999$	$450,000 + 201,000$									
$8 \text{ million subtract } 3\frac{1}{2} \text{ million}$	$604,000 - 25,000$										



Subtraction

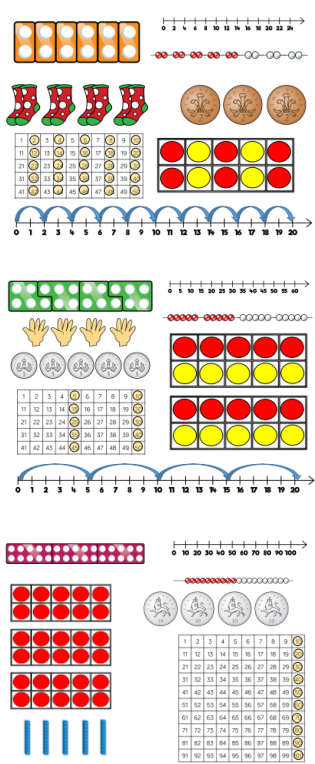
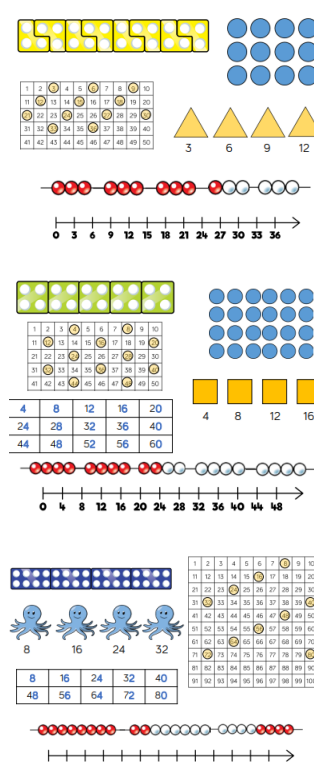
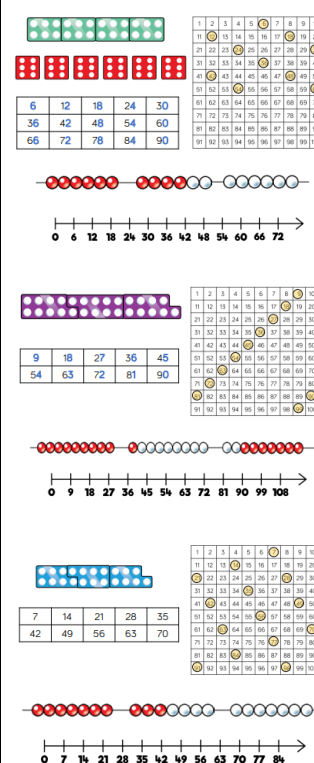
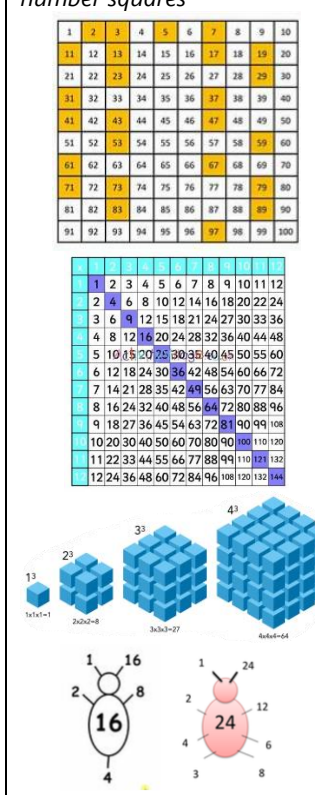
Fluency, Reasoning and Problem Solving

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Subtract from numbers within 10 and 20 <i>Finding parts and fact families using cubes, counters and objects.</i> Part whole models $8 - 3 = 5$ $8 - \dots = 3$ $3 = \dots - 5$ $5 = 8 - \dots$ Subtracting with crossing off Number line Subtracting 1 or 2 One less is To subtract 2, I can subtract 1 two times.	Subtract with 2-digit numbers <i>Continue to build fluency with fact families, and 10 more / 10 less. Begin to recognise commutative law. Objects, pictures. 100 squares and number lines.</i> Subtracting ones $46 - 1 =$ $46 - 2 =$ $46 - 5 =$ Subtract across a ten Subtract from a ten and 2-digit numbers $50 - 6 =$ $53 - 8 =$	Subtract with 2 and 3-digit numbers <i>Build confidence and fluency in mental calculation counting backwards and finding the difference. Introduce formal column subtraction. Dienes moving onto place value counters.</i> $425 - 7 = 418$ 7 can be partitioned into 5 and 2. The difference between 425 and 418 is 7. Bar and part-whole models Place value charts and formal column method Decimals as money Annie has £5.00. She buys 2 pens at £1.50 each. How much money does she have left?	Subtract with up to 4-digit numbers <i>Continue to use part-whole models, number lines and bar models. Dienes, place value counters, including decimals</i> Estimation by rounding to the nearest 10, 100, 1000. $4869 - 2531 =$ $4870 - 2530 = 2340$ $4800 + 2500 = 2300$ $5000 + 3000 = 2000$ Place value charts Formal column method Decimals to 2 places, including money	Subtract with more than 4-digit numbers <i>Build confidence and fluency in using part-whole and bar models and formal methods to compare numbers and solve multi-step addition and subtraction problems.</i> Mental strategies If $8 - 3 = 5$, then I know $800,000 - 300,000 =$ $500,000$ $26,480 - 2,999 =$ $2,999 + 1 = 3,000$ $26,480 - 3,000 = 23,480$ I then add 1 to get the answer 23,481 Checking strategies Estimate by rounding $26000 - 23000 = 23000$ Subtract decimals to 3 places Apply decimals in different contexts, including money and other measures.	Subtract numbers with increasing complexity <i>Children should be encouraged to use the abstract, using column method to subtract large numbers. Provide challenge to decide when a mental strategy is more efficient.</i> Introduce the term <i>integers</i>. Subtract with up to 3 decimal places



Multiplication – times tables

Fluency, Reasoning and Problem Solving

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Recall and use multiplication and division facts for the 2, 5 and 10-times tables. <i>Daily counting in multiples both forwards and backwards. Look for patterns using concrete manipulatives - odd and even numbers.</i> 	Recall and use multiplication and division facts for the 3, 4 and 8-times tables. <i>Daily counting in multiples both forwards and backwards. Look for patterns using concrete manipulatives - odd and even numbers; highlighting patterns on a 100 square. Make links to other tables.</i> 	Recall and use multiplication and division facts for the 6, 9, 7, 11 and 12-times tables. <i>Daily counting in multiples both forwards and backwards. Look for patterns using concrete manipulatives - odd and even numbers; highlighting patterns on a 100 square. Make links to other tables.</i> 	Recall and use multiplication and division facts to 12 and beyond, prime numbers, square numbers, cube numbers and common factors. <i>Daily practice – chanting and written to build fluency. Look for patterns using concrete manipulatives and number squares</i> 	Recall and use multiplication and division facts to 12 and beyond, prime numbers, square numbers, cube numbers and common factors. <i>Daily practice – chanting and written to build fluency.</i> 



11	22	33	44	55	66
77	88	99	110	121	132

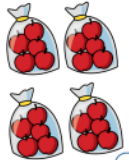
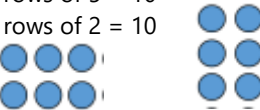
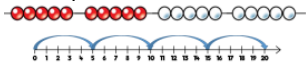
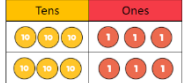
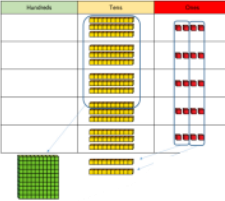
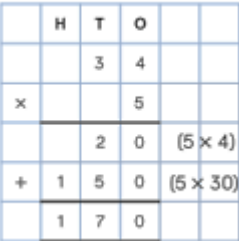
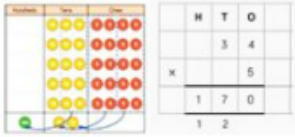
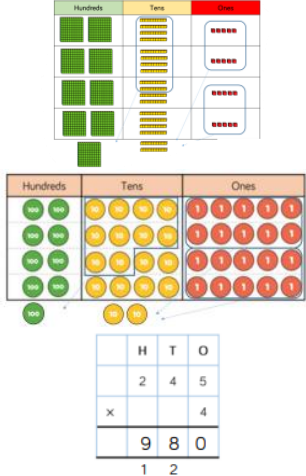
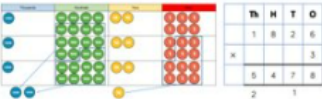
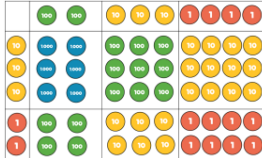
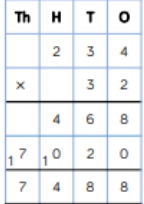
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11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

12	24	36	48	60
72	84	96	108	120
132	144			

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Multiplication						Fluency, Reasoning and Problem Solving					
Year 1		Year 2		Year 3		Year 4		Year 5			
Solve one-step problems with multiplication.		Solve one-step problems with multiplication.		Multiply 2-digits by 1-digit numbers.		Multiply 2-digits by 1-digit numbers and 3-digit by 1-digit numbers.		Multiply 4-digits by 1-digit numbers; 2-digit by 2-digit numbers and 2-digit by 3-		Multiply 2-digit by 4-digit numbers.	



Represent using concrete, pictorial representations and arrays. How many ears will 3 puppies have altogether?  $2 + 2 + 2 = 6$ There are 4 apples in one bag. How many apples are there 4 bags?  $4 + 4 + 4 + 4 = 16$ Begin to understand doubling.  2 rows of 5 = 10 5 rows of 2 = 10  Count in 2s, 5s and 10s	Represent using concrete, pictorial representations and arrays. Introduce the multiplication symbol. Use repeated addition  Arrays  $5 \times 3 = 15$ $3 \times 5 = 15$ $5 \times 3 = 3 + 3 + 3 + 3 + 3 = 15$ $3 \times 5 = 5 + 5 + 5 = 15$ Use arrays to teach children to understand the commutative law of multiplication. Count in steps of 2, 3, 5 and 10 from any number.	Use concrete and pictorial representations for informal and expanded methods. Use HTO as column headings. If I know that $3 \times 4 = 12$ Then I know: $3 \times 40 = 120$ Ten frames $16 \times 10 = 160$  Place value charts  $33 \times 2 = 66$ $34 \times 5 = 170$  	Use concrete and pictorial representations to understand the short multiplication method. $34 \times 5 = 170$  Progress with small steps to increase the number of exchanges and move from manipulatives. $245 \times 4 = 980$ 	digit numbers and 2-digit by 4-digit numbers. Children to use multiplication grids if they are struggling with times tables, to help concentrate on the method.  Area model - help to understand the size of the numbers involved.  Grid method <table><tr><td>x</td><td>200</td><td>30</td><td>4</td></tr><tr><td>30</td><td>6,000</td><td>900</td><td>120</td></tr><tr><td>2</td><td>400</td><td>60</td><td>8</td></tr></table> $7020 + 468 = 7488$ Formal method 	x	200	30	4	30	6,000	900	120	2	400	60	8	Children should be confident in using the formal written method. <table><tr><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>2</td><td>7</td><td>3</td><td>9</td></tr><tr><td>x</td><td></td><td></td><td>2</td><td>8</td></tr><tr><td>2</td><td>1</td><td>9</td><td>1</td><td>2</td></tr><tr><td>2</td><td>5</td><td>3</td><td>7</td><td></td></tr><tr><td>5</td><td>4</td><td>7</td><td>8</td><td>0</td></tr><tr><td>1</td><td></td><td>1</td><td></td><td></td></tr><tr><td>7</td><td>6</td><td>6</td><td>9</td><td>2</td></tr><tr><td></td><td></td><td></td><td></td><td>1</td></tr></table>	TTh	Th	H	T	O		2	7	3	9	x			2	8	2	1	9	1	2	2	5	3	7		5	4	7	8	0	1		1			7	6	6	9	2					1
x	200	30	4																																																											
30	6,000	900	120																																																											
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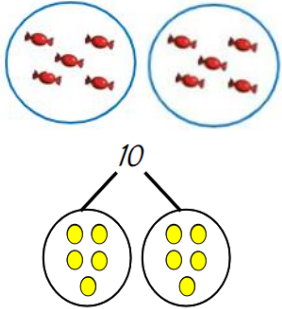
Division Fluency, Reasoning and Problem Solving					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Solve one-step problems Use concrete and pictorial representations. Children are	Solve one-step problems Use concrete and pictorial representations. Practice	Divide 2-digits by 1-digit	Divide 2-digits and 3-digit by 1-digit	Divide 2-digits, 3-digits and 4-digits by 1-digit	Divide multi-digits by 2-digits – short and long division



not expected to record formally. Practice subitising and count in multiples.

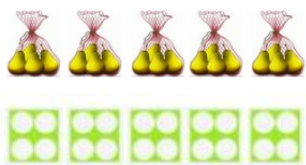
Sharing

I have 10 sweets can you share them equally into 2 groups?



Grouping

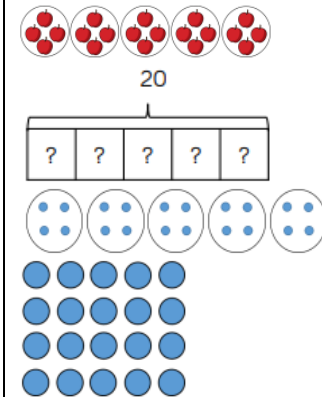
There are 20 pears altogether. They are put into bags of 4. How many bags are there?



subitising, counting in multiples and repeated subtraction. Introduce the division symbol.

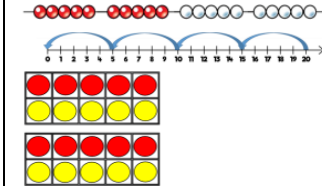
Sharing

$$20 \div 5 = 4$$



Grouping

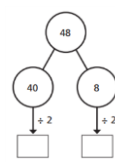
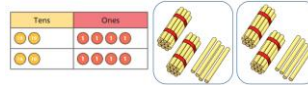
$$20 \div 5 = 4$$



Sharing without / with exchange and with remainders.

Partitioning - sharing

$$48 \div 2 = 24$$

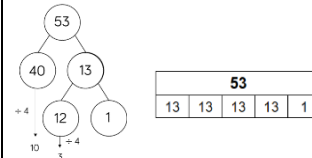
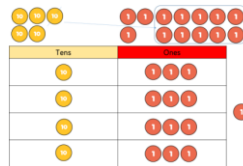


$$52 \div 4 = 13$$



52			
?	?	?	?

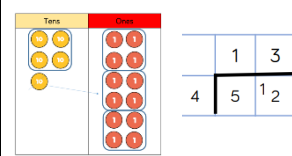
$$53 \div 4 = 13r1$$



Sharing and grouping with no exchange, with exchange. and with remainders. Introduce short division.

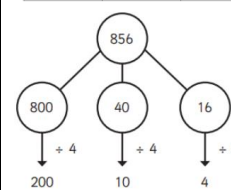
Grouping

$$52 \div 4 = 13$$



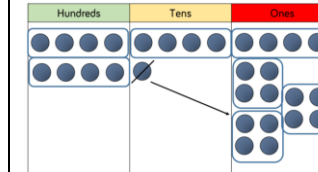
Sharing

$$856 \div 4 = 214$$

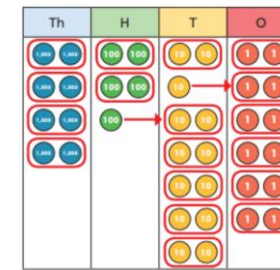


Secure understanding of short division through grouping. Encourage use of abstract when dividing with multiple exchanges.

Short division



	2	1	4
4	8	5	16



	2	1	4
4	8	5	16

$$\begin{array}{r} 214 \\ 4 \overline{) 856} \end{array}$$

Children write out multiples to support calculations.

Short division

7,335	÷	15	=	489
15		7	3	15

Long division

	0	4	8	9
15	7	3	3	5
-	6	0	0	0
	1	3	3	5
-	1	2	0	0
		1	3	5
-		1	3	5
			0	

		2	4	r	1	2
1	5	3	7	2		
-	3	0	0			
		7	2			
-		6	0			
		1	2			

Show remainder as a fraction

		2	4	$\frac{4}{5}$
1	5	3	7	2
-	3	0	0	
		7	2	
-		6	0	
		1	2	