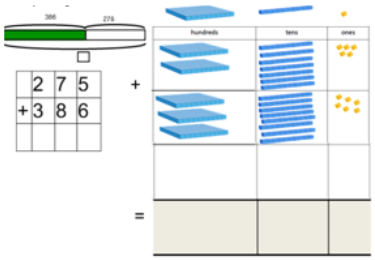
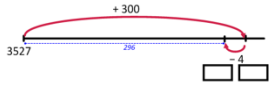
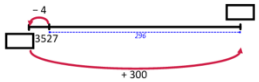
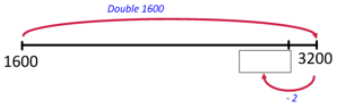
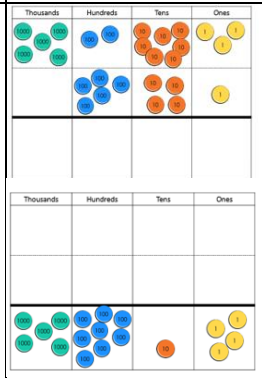
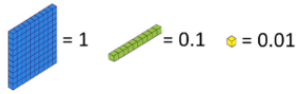
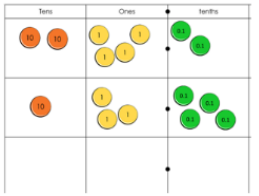
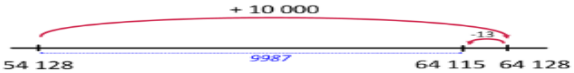
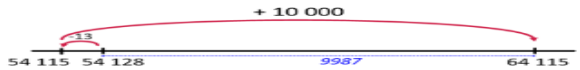
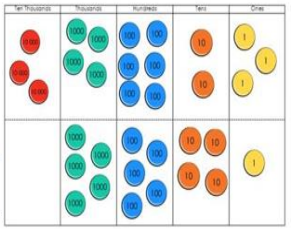
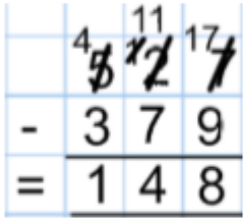
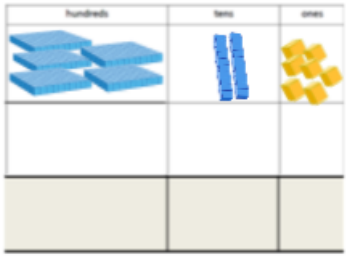
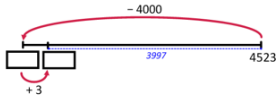
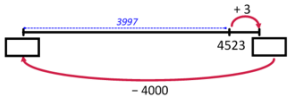
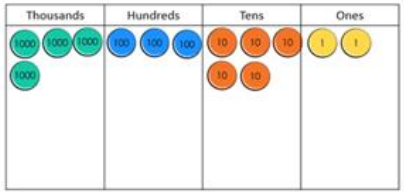
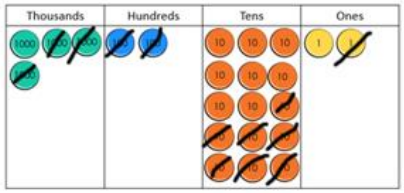
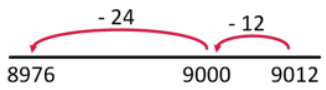
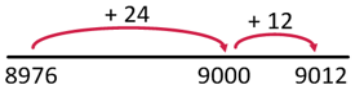
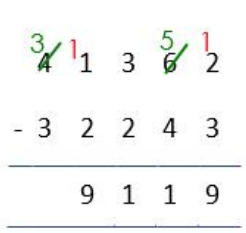
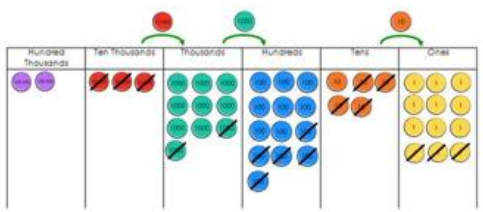
St.Peter-in-Thanet CE Junior School

Calculation Policy

Addition

<table>
<tr><th>Year Group</th><th>Mental Strategies</th><th>Written Strategies</th><th>Year Group Expectations</th></tr>
<tr><td>3</td><td>Using Dienes to represent an addition calculation:
e.g. 345 + 30 =
 
I know 4 + 3 = 7, so 4 tens plus 3 tens = 7 tens, therefore 345 + 30 = 375.</td><td> 
2 7 5
+ 3 8 6
5 + 6 = 11 so I will have 11 ones which I regroup for 1 ten and 1 one.
2 7 5
+ 3 8 6
6 6 1
1 1</td><td>-add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds
- add numbers with up to three digits, using formal written methods of columnar addition</td></tr>
<tr><td>4</td><td>Round and adjust
3527 + 296 = 3827 - 4
 
Completing the same calculation but adjusting first:
3527 + 296 = 3523 + 300
 
Near doubles
1600 + 1598 = double 1600 – 2
  </td><td> 
5 2 7 3
+ 5 4 1
5 8 1 4
1
 
24.2 + 13.4 =
  </td><td>-add numbers with up to 4 digits using the formal written methods of columnar addition</td></tr>
<tr><td>5 and 6</td><td>Round and adjust
 
54 128 + 9987 = 54 128 + 10 000 – 13 = 64128 - 13
Pupils should realise that they can adjust first:
 
54128 + 9987 = 54128 – 13 + 10 000 = 54 115 + 10 000</td><td>3 4 6 2 3
+ 5 5 4 1
  </td><td>-add whole numbers with more than 4 digits, including using formal written methods
- add numbers mentally with increasingly large numbers</td></tr>
</table>

Subtraction

Year Group	Mental Strategies	Written Strategies	Year Group Expectations
3	Using Dienes to represent an addition calculation: e.g. 375 – 30 =  I know 7 – 3 = 4, so 7 tens subtract 3 tens = 4 tens so 375 - 30 = 345	 4 3 11 12 17 - 3 7 9 = 1 4 8 	-subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds - subtract numbers with up to three digits, using formal written methods of columnar subtraction
4	Round and adjust 4523 – 3997 = 523 + 3  Completing the same calculation but adjusting first: 4523 – 3997 = 4526 - 4000 	  4 2 3 15 2 - 3 2 7 1 1 0 8 1	-subtract numbers with up to 4 digits using the formal written methods of columnar subtraction
5 and 6	Calculate difference by counting on and counting back 9012 – 8976  9012 – 8976 	 3 4 1 1 3 5 6 1 2 - 3 2 2 4 3 9 1 1 9 	-subtract whole numbers with more than 4 digits, including using formal written methods - subtract numbers mentally with increasingly large numbers

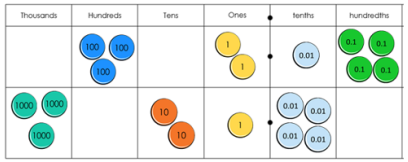
Multiplication

Year Group	Mental Strategies	Written Strategies	Year Group Expectations
3	Using known facts 5 = 1 × 5 50 = 10 × 5 500 = 100 × 5	3 x 12 12 = 10 + 2 3 x 10 3 x 2 Now add the total number of tens and ones × 10 4 / 3 30 12 × 10 4 / 3 30 12 14 × 3 = 42 × 10 2 / 3 × 10 2 / 3 30 6	- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
4	Multiplying by 10 and 100 and using known facts - arrays thousands hundreds tens ones 3 x 10 = 30 3 x 100 = 300 3 x 1000 = 3000 factor factor product 3 × 7 = 21 factor factor product 7 × 3 = 21	Partitioning – using distributive law Short multiplication method 14 x 6 10 x 6 4 x 6 7 x 6 7 x 6 12 x 6 2 x 6 Hundreds Tens Ones 241 × 3 = 723	-use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers -multiply two-digit and three-digit numbers by a one-digit number using formal written layout

5

Multiplying by 10, 100 and 100
Use knowledge of factors

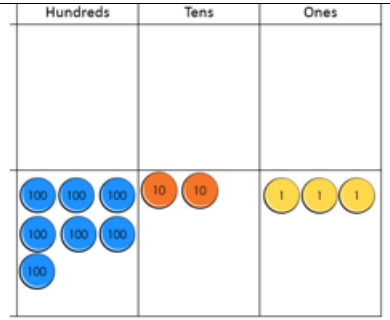
102.14 x 10 = 1021.4



Calculate 6 x 24 by using factor pairs of 24

Two and twelve are factors of 24:

$$\begin{array}{r} 241 \\ \times \quad 3 \\ \hline 723 \\ \hline 1 \end{array}$$



$$\begin{array}{r} 34 \\ \times 12 \\ \hline 68 \\ 340 \\ \hline 408 \end{array}$$

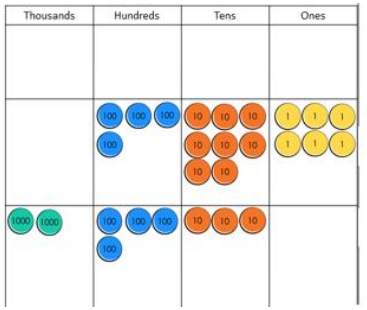
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply numbers mentally drawing upon known facts
- multiply whole numbers and those involving decimals by 10, 100 and 1000

6

Derive new facts from known facts
e.g.

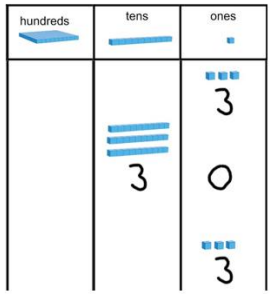
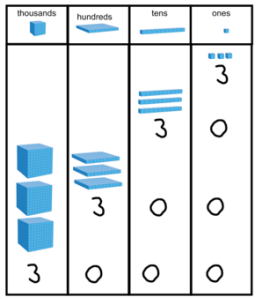
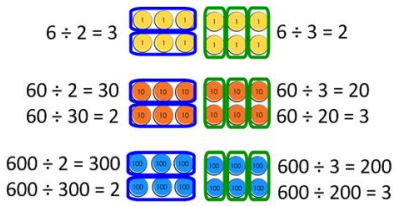
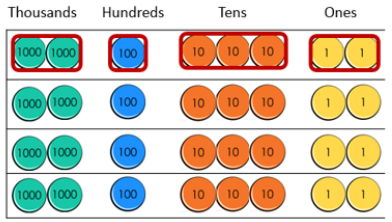
2 100 000		700 000 x 3	70 000 x 30	7000 x 300	700 x 3000	70 x 30 000	7 x 300 000
210 000		70 000 x 3	7000 x 30	700 x 300	70 x 3000	7 x 30 000	
21 000		7000 x 3	700 x 30	70 x 300	7 x 3000		
2100		700 x 3	70 x 30	7 x 300			
210		70 x 3	7 x 30				
21	=	**7 x 3**					
2.1		0.7 x 3	7 x 0.3				
0.21		0.07 x 3	0.7 x 0.3	7 x 0.03			
0.021		0.007 x 3	0.07 x 0.3	0.7 x 0.03	7 x 0.003		

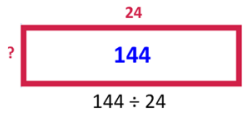
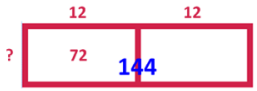
$$\begin{array}{r} 243 \\ \times \quad 12 \\ \hline 486 \\ 2430 \\ \hline \end{array}$$



-multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

Division

Year Group	Mental Strategies	Written Strategies	Year Group Expectations
3	Dividing multiples of 10, 100 and 100 by 10, 100 and 1000  3 × 10 = 30 30 ÷ 10 = 3		-write and calculate mathematical statements for division using the multiplication tables that they know
4	Dividing by 10 and 100  30 ÷ 10 = 3 300 ÷ 100 = 3 3000 ÷ 1000 = 3 300 ÷ 10 = 30 3000 ÷ 100 = 30 3000 ÷ 10 = 300	Division as sharing – short division method  	-pupils practise to become fluent in the formal written method of short division with exact answers
5	Deriving facts from known facts Using knowledge of factors to divide  	8528 ÷ 4 2 1 3 2 4 | 8 5 12 8 Sharing  	-divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

	 144 ÷ 24  144 ÷ 2 ÷ 12 I know 2 and 12 are a factor pair of 24 and so I can divide by 2 and then by 12.		
6		34 12 ⟌ 408 36 48 48 0	-divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context - divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context